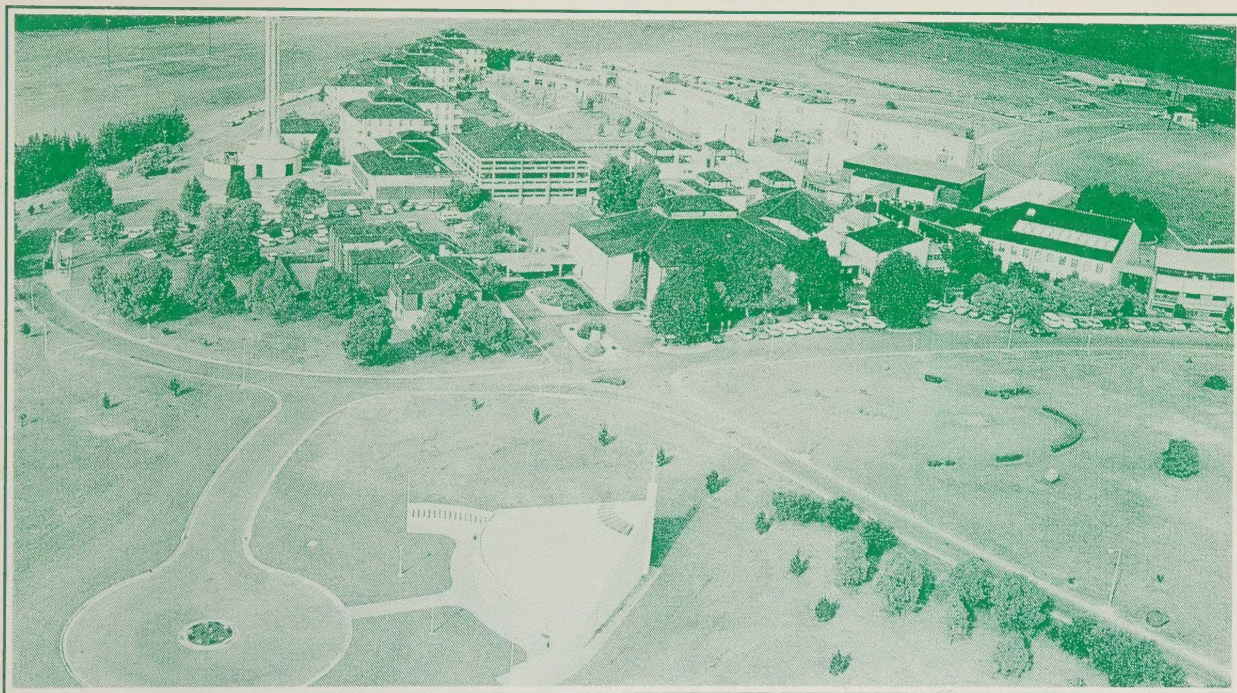


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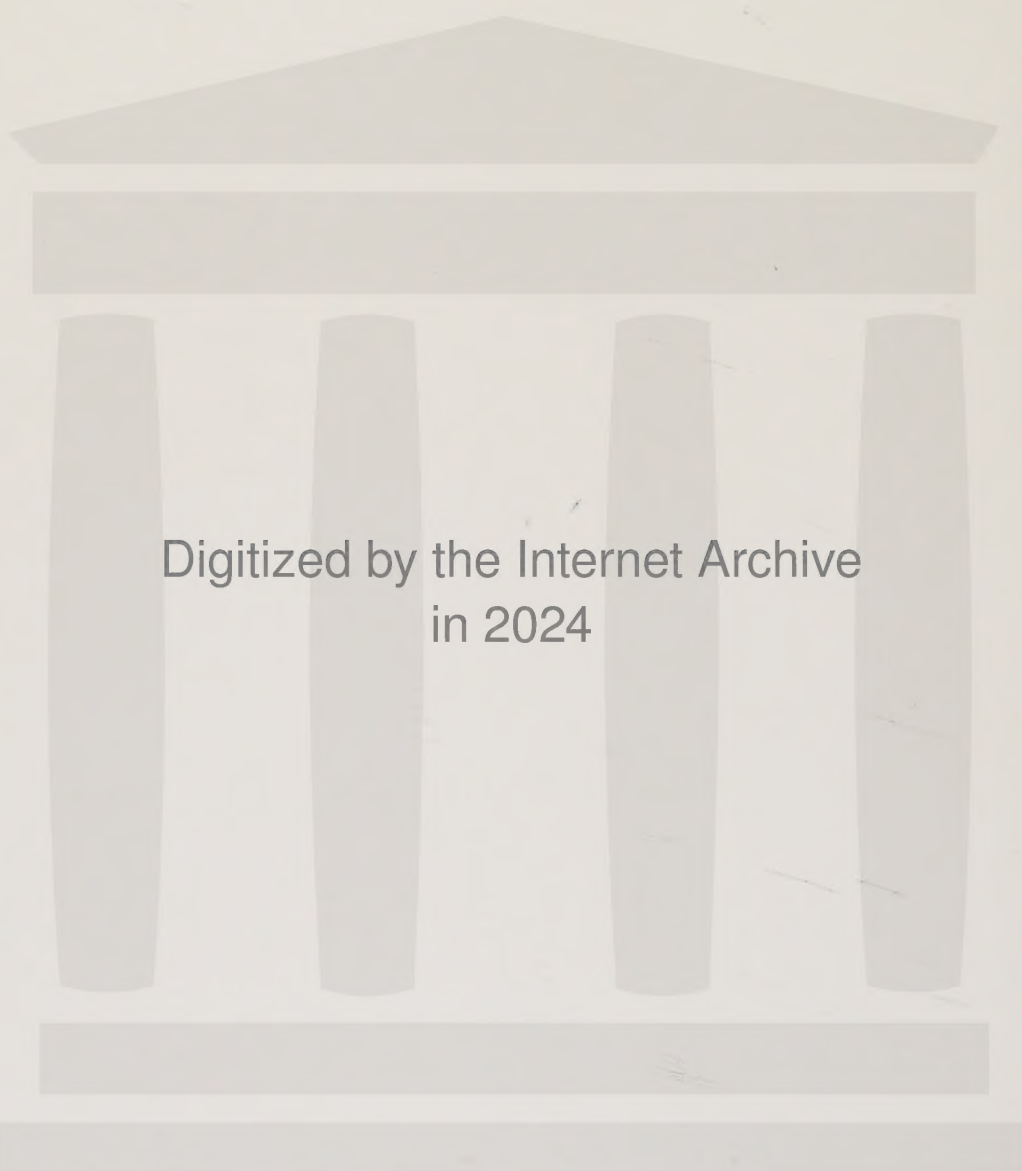
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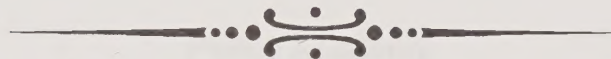
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Eighth Biennial Noxious Weeds Conference



Police Academy
Goulburn, N.S.W.
September 19-21, 1995

Volume 2

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**Proceedings
of the 8th Biennial
Noxious Weeds
Conference**

Volume 2

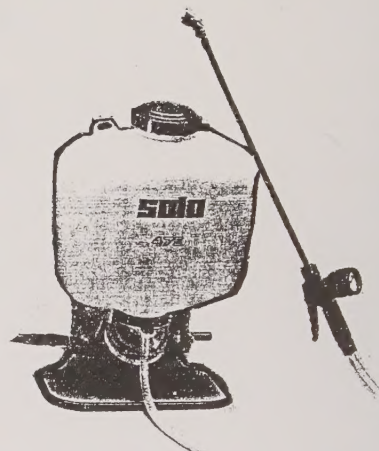
Police Academy
Goulburn, N.S.W.
September 19-22, 1993

**Peter Gorham
Conference Convener
NSW Agriculture
Cowra**

*Many thanks to
Sheryl Greentree, NSW Agriculture, Cowra
for art design/layout work and other
clerical support in the preparation of papers for the
8th Biennial Noxious Weeds Conference*

**Proceedings Volume 2
edited by
Les Tanner
NSW Agriculture**

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PROGRAM

8th Biennial Noxious Weeds Conference

Tuesday, 19th September
Wednesday, 20th September
Thursday, 21st September

NSW Police Academy
GOULBURN

1995



8th BIENNIAL NOXIOUS WEEDS CONFERENCE

Program

DAY 1 - TUESDAY, 19th SEPTEMBER 1995

CHAIRMAN - VAL STUBBS, MID-WESTERN COUNTY COUNCIL

- 8.30 Housekeeping *Peter Gorham*
8.40 Welcome to the Academy *Reg Mahoney, Chief Superintendent*
8.50 Welcome to Goulburn City *Mayor of Goulburn*
9.00 Opening Address *John Wearne, President Shires Association of NSW*
9.15 Strategic Approach to Noxious Weed Control *Doug Hocking, NSW Agriculture*
9.35 Keynote Address: "Weed Management Towards 2000"
..... *Dr Bruce Wilson, Qld Dept of Lands*

10.00 Morning tea

CHAIRMAN - IAN KELLY, CASTLEREAGH-MACQUARIE COUNTY COUNCIL

- 10.30 National Weeds Strategy: From Words to Action *Ian Smith, Agriculture Vic*
11.00 Noxious Weeds Strategy for NSW *Bob Paton, Consultant*
11.20 A Strategic Approach to Planned Management -
Serrated Tussock Action Plan *Bob Sproule, NSW Agriculture*
11.45 Bitou Bush Control in the Shoalhaven with Community Involvement
..... *Ian Borrowdale, Shoalhaven City Council*
12.00 Managing Vegetation in an Urban Environment Based on Catchments
..... *Dr Jocelyn Powell, Hawkesbury Nepean Catchment Management Trust*

12.30 Lunch

CHAIRMAN - BOB LEECH, CROOKWELL SHIRE COUNCIL

- 1.30 Setting Priorities in Industrial Weed Management *Jim Longworth, State Rail*
1.50 An Enhanced Weed Management Program for NSW National Parks
..... *Dr Andrew Leys, National Parks & Wildlife Service*
2.10 Cycle Planning for Effective Woody Weed Control *David Theriault, DowElanco Aust*
2.30 Promoting Yourself Through Planning *Ken Fishpool, NSW Agriculture*

3.00 Afternoon Tea

DAY 1 - TUESDAY, 19th SEPTEMBER 1995 continued

CHAIRMAN - RON FRANCIS, BLUE MOUNTAINS CITY COUNCIL

- 3.30 Mapping Weeds Accurately Using GPS *Peter Terrett, Global Star*
4.00 Long Term Planning Success in Containing Mimosa Pigra
..... *Ian Miller, Northern Territory Department of Primary Industry & Fisheries*
4.20 Computerised Inspection & Mapping Program *Scott Clark, Rapid Map Australia*

EVENING SESSION

- 7.00 Elected Members' Meeting
Noxious Weeds Officers' Association Meeting

DAY 2 - WEDNESDAY, 20th SEPTEMBER 1995

CHAIRMAN - KIM BELLAIRS, FAR NORTH COAST COUNTY COUNCIL

- 8.30 Biological Control of Weeds in NSW *Paul Sullivan, NSW Agriculture*
8.40 Mapping Weeds for Biological Control Programs *Alan Maguire, NSW Agriculture*
8.50 Role of Council Weeds Officers in Biological Control Programs
..... *Paul Sullivan, NSW Agriculture*
9.00 Licenses for Herbicide Use in or Near Water *Dr Jane Mallen-Cooper, EPA*
9.20 Saving Wetlands from Weed Invasion *Geoff Sainty, Sainty & Associates*
9.40 Groundsel Bush Management Plan *Jeff Thomas, National Parks & Wildlife Service*

10.00 Morning tea

CHAIRMAN - ROB DONOHUE, GRAFTON CITY COUNCIL

- 10.30 Streambank Weeds *Geoff Sainty, Sainty & Associates*
10.45 Alligator Weed MIA Campaign - Has it Been a Success? *Hugh Milvain, NSW Agriculture*
11.05 Parthenium Weed Alert *Peter Gray, NSW Agriculture*

11.40 Lunch

12.30 FIELD TOUR - CSIRO CANBERRA

Tour of facilities - Update on current and planned weed biological control programs - Scientists and Technicians from the Division of Entomology.

Division of Plant Industry biological control programs, Dr Richard Groves. Also from the Division of Plant Industry, Phil Larkin and Danny Llewellyn will talk about genetic engineering in plants.

6.30 EVENING MEAL - HELLENIC CLUB, WODEN

DAY 3 - THURSDAY, 21st SEPTEMBER 1995

CHAIRMAN - PETER GRAY, NSW AGRICULTURE

- 8.30 Legal section - the Noxious Weeds Act 1993 - Is it working? - Changes? Problems? Penalty Notices? Answers to Questions Put by Leas and Other Groups in Response to Survey - Declaration of W4 Weeds in Urban Areas - Property Inspection Procedure
Sally Pearmain, NSW Agriculture
Lesley Skinner, NSW Agriculture

10.00 Morning tea

CHAIRMAN - IAN TYE, MACLEAN SHIRE COUNCIL

- 10.30 Herbicide Resistance - Which Herbicide Group? *Jim Dellow, NSW Agriculture*
10.50 Managing Silverleaf Nightshade *Barney Milne, NSW Agriculture*
11.10 Dupont Product Update *John Abbott, DuPont Aust*
11.25 Proper Management of Empty Farm Chemical Containers *Doug McGuffog, Avcare*
11.50 Analysing Weedicide & Pesticide Residues for Compliance to Occupational Guidelines
Robert Geyer, Workcover Authority
12.10 The Advantages of Using Retractable Reels *Grant Mitchell, Quick Spray*

12.30 Lunch

CHAIRMAN - KEN HAYES, COFFS HARBOUR CITY COUNCIL

- 1.30 Adjuvants - Future Trends *Alex McLelland, AB McLennan Management Services*
1.50 Prickly Pear - A New Noxious Weed *Les Tanner, NSW Agriculture*
2.05 Water hyacinth in the Hawksbury-Nepean River System *Geoff Keech, Macspred*
2.25 Product Update *Keith Fallow, Monsanto Aust*
2.40 Dry Product Technology & Envirodrums *Nufarm Ltd*

3.00 Afternoon tea

CHAIRMAN - GRAHAM MATTHEWS, BELLINGEN SHIRE COUNCIL

- 3.30 What is Stress? *Jan Westerink, Aust. Graduate School of Police Management*
4.00 Potential Invaders- Weed Alert
Weeds Awareness Week 1996 *Bob Trounce, NSW Agriculture*
4.30 Closing Address *John Fisher, NSW Agriculture*

7.00 CONFERENCE DINNER





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A word from the Conference Convenor

Organising a conference can stir up a few anxieties! How many will come? Will the topics be of interest? Will the venue be suitable?

Well, as Hugh Mulvain often says, "NOT TO WORRY" and he was right. This was our biggest attendance yet - over 300 delegates - and from all reports, a very successful conference with the venue being given the thumbs up and I heard on the grape vine it was a very successful week for the bar sales. I didn't receive any discounts though or any complementary exemptions from future infringement notices. "NOT TO WORRY".

As mentioned above the conference was a great success and this was due to a team effort. Firstly my thanks go to the members of the organising committee for their input into the structuring of the conference and their untiring assistance during the conference.

My personal thanks to all the speakers for giving their time to present their papers which certainly conveyed excellent technical information on a number of weed control practices, information that is not always available from other sources. Their presentations certainly highlighted the conference theme, "Better Planning for Better Weed Management".

A special thanks to all our sponsors. Their support and sponsorship of the many competitions over the years has played a significant role in ensuring the conferences are successful. A special thanks must go to DowElanco Australia, Du-Pont Australia and Monsanto Australia who have been loyal sponsors since the first conference in 1981.

Many thanks also to the chairpersons who ensured all the sessions ran to time. A special thanks also to Les Tanner, Proceedings Editor for the countless hours spent at the keyboard.

Another person who deserves a special mention is our good friend Sharon Corey, from the CSIRO at Canberra. Sharon helped in organising our mid-week trip to Canberra - the CSIRO presentations, the brief tour of Canberra and our evening meal. Thanks, Sharon!

Congratulations to Kim Bellairs for her appointment to President of the Weeds Officers Association. Also to the winners of the Competitions and Awards.

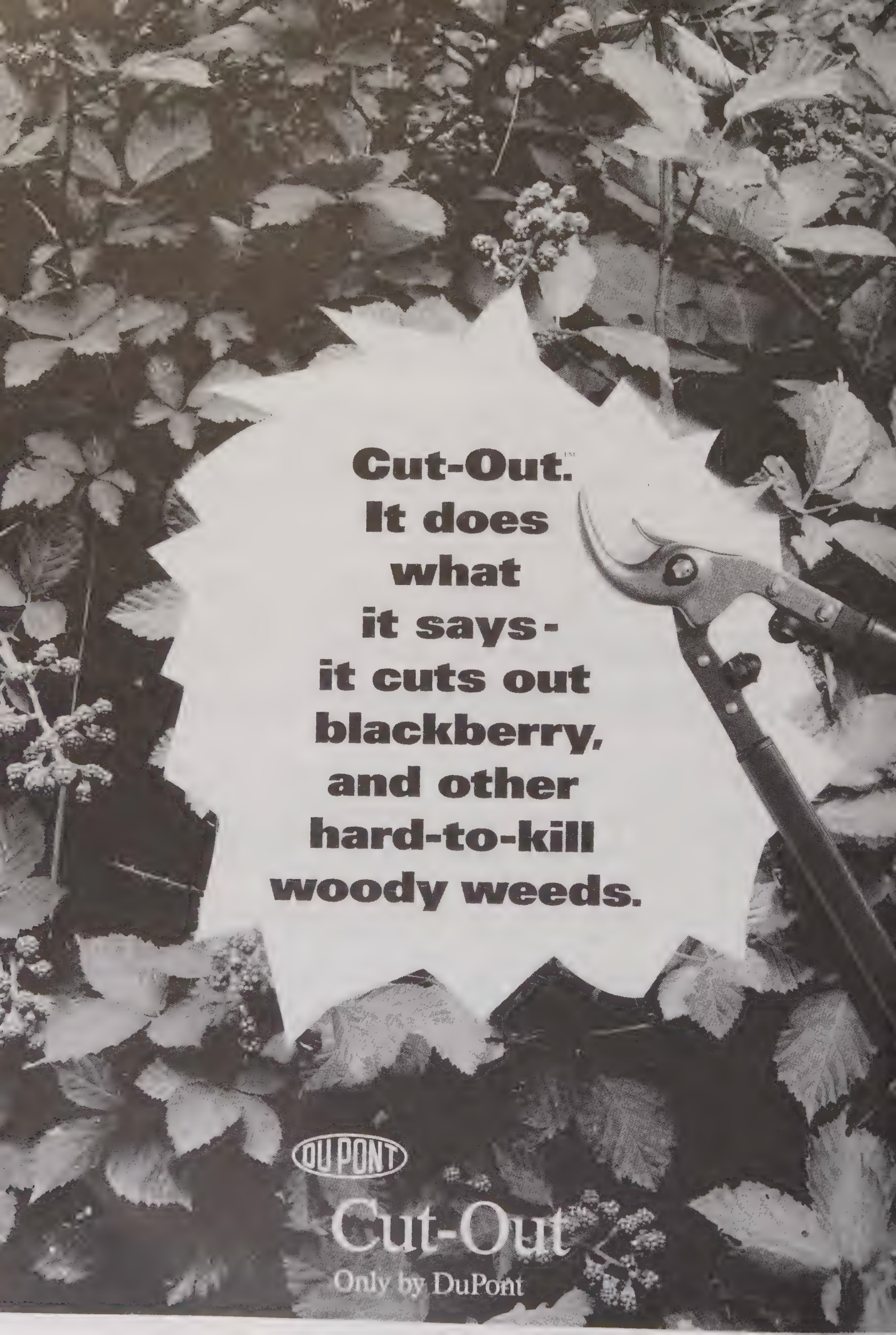
Don't forget the 9th at Dubbo in '97. All the best to Peter Gray.

Lastly, thank you all again for showing your support for the conference by the overwhelming attendance and I hope it was a week of gaining and sharing information and catching up with old mates.

Many thanks



Peter Gorham



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OFFICIAL OPENING
EIGHTH BIENNIAL NOXIOUS WEEDS CONFERENCE
GOULBURN, 19 SEPTEMBER, 1995

Councillor John Wearne
President
Shires Association

Delegates, ladies and gentlemen

I would like to begin by saying how pleased I am to have the opportunity to open this most important conference. I would also suggest that the growing importance of noxious weed control within NSW and, indeed, nationally is reflected in the impressive number of you who are attending this conference as delegates.

Ladies and gentlemen, in any language, weed control is big business. I am going to have to leave it to history to judge whether our endeavours in the future will be big enough to hold the line against what are clearly ever-encroaching problems.

It has been estimated that the cost of noxious weeds to agriculture is about \$3 billion per annum. This represents an enormous loss in productivity.

Our response in NSW is to apply something like \$15 annually towards weed control and eradication. The funding sources - and I will stand correction on these figures - is \$4.5 million from the Department of Agriculture's internal budget and something approaching \$5 million from Local Control Authorities which is matched by an equivalent State Government grant.

Consequently, a strategic approach towards identification, classification, prioritisation and control measures themselves is absolutely vital, and it is encouraging to see a number of sessions listed on the conference program dealing with strategies.

When you are attacking a \$3 billion problem with a \$15 million solution - which is akin to belting Mike Tyson with a feather - there is no room for anything but the maximum levels of efficiency and cost effectiveness.

When we mention Local Control Authorities, then this is where Local Government comes in and the key message I wish to leave you with today is that the Local Government and Shires Associations are totally committed to the suppression and eradication of noxious weeds and to pressing the State Government for more funds with which to do so.

And, of course, noxious weeds are not only a rural problem. There are particular concerns in our urban communities as well which are not being fully addressed.

These are not only related to land management. There are problems with the spread of noxious weeds in our waterways, such as the Hawkesbury-Nepean System.

I was interested to see that a session has been set for tomorrow morning on streambank weeds.

This is particularly interesting in view of the work currently being undertaken by Weeds Control Officer and Advisory Committee member, Mike Boulton, who is working on the preparation of a GIS inventory on the status of aquatic weed infestations in this state.

The involvement of the Shires Association in noxious weeds issues goes back many years. As many of you would know, the Association is organised on a Divisional basis with the Executive Council elected by the Divisions. Until about fifteen years ago, there was a Division specifically for all county councils including those set up for noxious weeds eradication.

The Executive decided in 1980 that apart from the noxious weeds authorities, county councils should transfer into the Division closest to their headquarters. The idea was for noxious weeds to be given higher priority.

The Divisional representative of the noxious weeds counties was also a member of the Noxious Weeds Advisory Committee.

This arrangement worked reasonably well, however, in recent times there was growing concern for our general purpose councils that they did not have enough opportunity to be involved in policy making or have sufficient contact with the Noxious Weeds Division representative because of the special Divisional arrangement.

The wheel has now come full circle and the June, 1995 Shires Conference resolved that the Division should be abolished and all noxious weeds matters should now be dealt with by the Executive. The noxious weeds county council's are now serviced with our general purpose members.

The view was that this would give the issues much higher priority. It would also allow general purpose councils direct access to raise issues and be more involved in finding out what was going on.

The Executive last month had a long discussion about the best way to now deal with the issues. One of the keys will be closer liaison with the Noxious Weeds Advisory Committee.

This body has three Local Government representatives: Cr Len Woods and Cr Malcolm Olive (Shires Association) and Cr Les Shore (Local Government Association). Together these members promote a Local Government view point through the Committee to the State Government.

I think it is essential that the Associations improve their links with these representatives, and the Executive has had discussions with Cr Len Woods about how this might be done. We have also talked to the Chair of the Committee, Doug Hocking.

I hope this explains the Associations' commitment to maintain the priority we believe needs to be given to this issue.

We have also spoken to Doug Hocking about holding a series of regional seminars next year about noxious weeds problems and solutions.

Our member councils have told us very clearly they want us to spend more time in the country listening to their problems. Interactive seminars are a good way to do this. The intention is to visit four or five regional centres which have good access points to rural communities. Our speakers would present the same material at each session and the intention would be that the seminars are action oriented rather than just talk fests.

I am keen that the Association use the expertise of our member councils more in problem identification and solution finding. The Shires Executive, while it represents all rural councils, does not have all the answers. But the collective skills of the 1,850 or so councillors spread right across NSW can bring a powerful knowledge basis to promoting change. That is a major initiative I would like to see during my term as President.

I think we need to have creative solutions to a big problem. There are simply not enough funds available from government to do all the work necessary. We need to build better links with bodies such as the Total Catchment Management Committee and Trusts and Landcare, which do have access to reasonable funds, so they can factor noxious weeds issues into their policies and priorities.

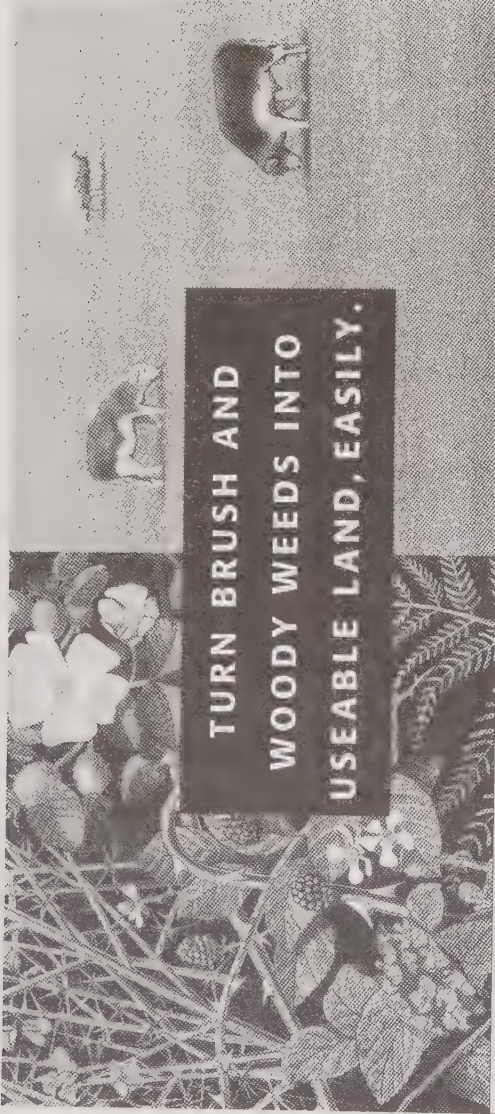
I was delighted to be given the opportunity to open this most important conference and to reassure you about the Association's commitment to maintaining our policy profile.

This conference represents an excellent opportunity for appropriate agencies and practitioners to get together and discuss the latest developments in this key area.

Both Associations will continue to give high priority to encourage the government to provide improved funding and better coordination of the various bodies responsible for land care in all its forms.

Ladies and gentlemen, it is a great pleasure for me to declare this 1995 Noxious Weeds Biennial Conference officially open.

--ooOoo--



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WEED MANAGEMENT TOWARDS 2000

Dr Bruce J Wilson
A/Director, Research
Land Protection Branch
Queensland Department of Lands

ABSTRACT

Future weed management should be based on the following key principles: preventative weed management, planning, sustainable land use, conservation of biological diversity, local ownership of issues, readily available information, objectively-based decision making, community awareness, whole systems approach, maximising resources and training.

Weed management plans are classified according to scale (from national to property level) and scope (single species or comprehensive). Plans at each level of scale must be consistent with those higher in the hierarchy and single species plans must be consistent with comprehensive plans. Weed management plans must also link into the hierarchy of natural resource management and organisational plans. Queensland is implementing Local Government pest management and property-based species plans.

In addition to planning, the principles are being addressed with other initiatives in Queensland - management of potential weeds, pest status assessments (reviews to identify control objectives, policy and information gaps), urban community awareness of weeds, Ministerially approved policy development, strategic weed control and an information system (Pestinfo).

INTRODUCTION:

Australia is entering a challenging and potentially very rewarding period for weed management. There are many changes occurring which are to the advantage of weed management - the recognition of the importance of weeds at "grass roots" level in the landcare movement, the recognition of the conservation impact of weeds and the development of the National Weeds Strategy, to name just three. Whilst there are changes which challenge current weed management methods, such as the issue of chemical residues, these are clearly secondary to the positive changes.

This review addresses the principles for future weed management, the relationships of weed management plans and examples of initiatives in Queensland.

PRINCIPLES FOR FUTURE WEED MANAGEMENT

Preventative weed management

Preventing the introduction of weeds and early control of new infestations are by far the most cost effective methods of weed control. This principle can be applied at all levels of scale, from the paddock to Australia-wide. It involves the concept of potential weeds - species that could establish and have an adverse impact but are not yet present; they may not be a weed anywhere else.

Preventing the introduction to Australia of new plant species with weed potential, and ensuring early detection and rapid action against new weed problems is being addressed through the National Weeds Strategy. For weeds that are already established in Australia, there is still much that can be achieved from preventative management at the State, catchment, regional, property and paddock level. Implementing preventative weed management requires a shift of focus and resources in extension, policy, operational priorities and research.

Key requirements are:

- 1 landholder, industry and general community awareness of potential weeds and the means of spread.
- 2 ability of landholders, weed officers and other key people to identify potential weeds or obtain identification of any new or "strange" plants.
- 3 reporting procedures involving all herbaria.
- 4 contingency plans for action against new weed infestations.
- 5 effective technically-based procedures for restricting spread, appropriate to the scale.
- 6 consultation, co-operation and awareness involving nurseries, aquarium supply outlets and seed merchants.
- 7 legislative support, including legislation which is consistent between States.

A major component of preventative weed management is the concept of **strategic weed control**, defined as control of infestations which are strategically important in the management of the species. Weed infestations may be minor, having a negligible impact in their current location, but be a source for spread throughout the property, region, catchment or state. Control is clearly required to prevent spread, and assistance to the landholder(s) is strongly justified because of the wider community benefit.

Planning

Planning is a function for handling the future. It involves deciding on objectives or goals, and then deciding the "how", "what" and "who". The process includes involvement of all stakeholders, a scan of external and internal influences (including legislative obligations), an analysis of resources available, and establishment of implementation and monitoring mechanisms. Weed management plans range from the national strategic level to the farm operational level.

Planning provides the following benefits:

- 1 all participants achieve an increased understanding of the subject and increased ownership and commitment to the plan.
- 2 legislative and policy responsibilities are addressed.

- 3 a means of identifying issues and establishing priorities is provided; better resource allocation should follow.
- 4 allocation of responsibilities between and within organisations is clearer.
- 5 essential links with higher order weed management plans and organisational plans (e.g. corporate plan) are addressed.
- 6 increased stakeholder acceptance of obligations.
- 7 the plan and an assessment of its implementation provides a basis for accountability.

Sustainable land use

Sustainable use of renewable resources is essential for our long term survival. Sustainable land use is embodied in national and international agreements. It is supported by widespread concern for the environment and will clearly continue to be a strong priority for communities and governments (Taylor 1995).

Exotic weeds are a major factor in sustainable land use. Weeds are often a symptom of underlying land management problems, such as overgrazing and lack of fire. Economic pressures are also facilitating inappropriate land management regimes and a resultant increase in weed proliferation (Csurhes 1992). There is a clear responsibility to address current land management regimes which contribute to weed proliferation, and to develop weed management methods which are sustainable.

Conservation of biological diversity

Australia's long isolation from other continents has resulted in a flora and fauna that is very high in species unique to Australia. For example, 85% of vascular plant species and 82% of mammal species are endemic (Anon 1994). Thus the conservation of our biological diversity has special significance. This is recognised in a National Strategy and warrants the increased community support and resources that it is receiving.

Weeds are one of the major threats in conservation and hence the current rapid increase in the recognition of environmental weeds - weeds whose impact is solely or partly on natural ecosystems. Weeds are well recognised by the National Strategy for the Conservation of Biological Diversity and targets are set for the development of species-specific management plans and the number of successfully controlled species. At all levels of scale, the conservation impact of weeds needs to be addressed. However, in doing so there will be pay-offs in attracting resources - whereas conservation benefits were once a spin-off from production-based funding, now there will be situations where the reverse occurs.

Local ownership of issues

Local ownership means involving local individuals or groups in the decision-making process and the subsequent actions. Local ownership is of such importance that it is one of nine principles of a sustainable society (IUCN/UNEP/WWF) - *"Most of the creative and productive activities of individuals or groups take place in communities. Communities and*

citizens groups provide the most readily accessible means for people to take socially valuable action as well as to express their concerns. Properly mandated, empowered and informed, communities can contribute to decisions that affect them and play an indispensable part in creating a securely-based sustainable society."

The Queensland Department of Lands received a Treasury initiative in 1992-95 which provided funds for control co-ordinators and strategic control operations (herbicides and equipment). In the course of implementation there was consultation with Shires, local landholders, Landcare groups and local staff of State Departments. This resulted in a commitment to projects and additional resources of labour and equipment from these parties demonstrating the benefit of local ownership of activities. It is also intended that local ownership will result in maintenance of sites to control seedlings or other regrowth.

Readily available information

Information is essential in weed management at all levels of scale and for all activities - control operations, planning, policy development, extension and research. Furthermore, information needs to be readily available.

Information needs include National and State Strategies; all catchment, county council, regional or local government plans; state-wide species plans; legislation and policies; description of biology, distribution; declaration status and control methods for all weed species; standard extension brochures and major workshop reports. All of this information could be made available via a computer-based information system.

The species distribution both present and potential, should be on a geographic information system (GIS) so that it is graphically presented and can be analysed in relation to other layers of information (e.g. boundaries, climate and soils). The system should also be capable of linking to local government/county council systems recording weed control inspections, operations and serving of notices.

How much information is not even known to each of us? How much time is wasted trying to find your copy of documents?

We are constantly reminded that this is the information age. Weed management must be a part of it and the above proposals are all technically feasible.

Objectively based decision making

In the management of noxious weeds, there is often pressure applied on government agencies by community, industry or special interest groups to declare a species, provide subsidies, or conduct control operations. Demands for action usually arise from one group but are commonly supported by many neighbouring groups. The concern is usually genuine, but is narrowly focussed on one species, in one part of the State, and at one point in time.

Decision making in response to the pressure can lead to distorted priorities and wasted resources by attempting non-achievable objectives.

In response to these situations, and in any case to support sound decision making, there needs to be a process of objectively assessing a species or issue, using available technical information.

Community awareness

Australia is largely an urban society, so urban community awareness of weeds is vital for several very different reasons:

- * it follows from the above, that the majority of tourists are from urban areas, and with the assistance of 4WD vehicles, are visiting all of Australia's ecosystems. An awareness of weeds is important in seeking compliance with any quarantine or washdown requirements.
- * at least some of our future weeds are still in the gardens and aquariums of Australia. Community awareness is necessary in avoiding dumping of garden rubbish in bush areas, and avoiding distributing and growing invasive plants, either from cuttings or purchases from nurseries and aquarium shops. Urban community support will also assist the implementation of the precautionary principle and so restrict the introduction to Australia of species which could be invasive.
- * the urban community has a dominant role in the political process and thus ultimately urban support is required for the allocation of resources to weed management.

Whole systems approach

A whole systems approach means addressing the whole of the system; the scale may be at the property, catchment or ecosystem level. In research, a system may also range from a single leaf to the earth (Hynes and Scanlan 1993). Scale also includes a time dimension. The systems approach means careful identification of the components of the system and their relationships. This means considering all requirements and consequences of weed management - farmer or community goals (eg. commitment to completing a project), resources for a permanent reduction in weed impact (eg. the need for follow-up action), causes of the problem which if unchanged may lead to reinvasion, and consequences such as the need for revegetation, dead woody weeds blocking creeks or invasion by another weed.

Maximising resources

The financial, labour and physical (equipment) resources available to weed management is larger than readily obvious, although complex. Limited financial resources above base funding can be accessed from the Commonwealth Government (e.g. Drought Landcare) and may be available from State Government initiatives.

Labour is available through a wide variety of sources - employment and training programs, prisoner work schemes, volunteer groups and from co-operation with landcare and bushcare groups, landholders and staff of government agencies. Equipment can be directed to weed management through co-operation with groups, landholders and other government agencies.

In seeking to maximise resources, the principle of readily available information (for funding and labour programs) and local ownership (to achieve cooperation) are essential.

Quality management

Although this is one of the current "buzz terms" of management, it does have a real value for weed management. Exotic weed management involves legislation, declaration of some species, specified levels of control, provision of assistance in some cases (herbicides, equipment), restrictions on movement of declared plants (or plant parts or seed), and operations involving local government and landholders. For efficient and effective weed management, all stakeholders (employees and landholders) must know what they are to do, how it is to be done and who they report to; all necessary equipment, instructions or information must be available. A quality management system will meet these needs.

The legislation for weed management is the responsibility of state departments, so responsibility for quality management starts at this level. The requirements of the department for what is to be done must be clearly documented and available in the forms of policies, procedures, guidelines, model plans and forms.

Training

Effective weed management can only be fully achieved with skilled staff, from corporate policy officers and research scientists to field operators. Staff must be skilled not only to ensure the obvious benefits in efficiency and effectiveness, but also to ensure safe working conditions and no adverse consequences of activities (e.g. herbicide residues or spray drift).

Training should be competency based in accordance with national standards, that is focussed on what is required broadly of an employee in the workplace and what a person can do as the result of the training.

RELATIONSHIPS OF WEED MANAGEMENT PLANS

Weed management plans can be classified on two attributes:

- 1 **Scale** ie. address issues at a national, state, regional or property level.
- 2 **Scope** ie. comprehensive weed management versus single species.

The relationships of the two streams of comprehensive and single species plans at the different levels of scale are illustrated in Figure 1.

Weed management plans must contribute to and be consistent with plans for wider components of natural resource management and in some cases organisational Corporate Plans; the relationships are shown in Figure 1.

Natural resource management and organisational plans.

At the highest order are plans which address issues across all industries and communities Australia-wide - the National Strategy for Ecologically Sustainable Development and the National Greenhouse Gas Response Strategy.

At the next order down are the sectoral national strategies which are more specific. These have a widely varying basis - climate determined area (rangelands), vegetation class/production system (forests) and conservation (biological diversity). There are other national strategies but these are ones that include weed management.

At progressively lower orders are State-based strategies, Regional/Local strategies or plans (e.g. catchment strategies, South-West strategy for the mulga region of Queensland, corporate plans for local governments) and property management plans.

Weed management plans - species specific.

National weed species plans address the management of a species Australia-wide. There are no plans developed for established species but the kochia (*Kochia scoparia*) and Siam weed (*Chromolaena odorata*) eradication plans could be considered as examples; they are approved Australia-wide (through the Standing Committee for Agriculture and Resource Management) and funded by AQIS and the States at risk.

State weed species plans may either address a State's component of a national species plan, and must be consistent with the national plan, or address a state-based priority species. An example of the latter is the Strategic Plan for the Control of *Harrisia* Cactus in Queensland. This plan was developed by four representative landholders, the Chairman of the Rural Lands Protection Board and departmental staff. It follows a model strategic plan format with goals, strategies and actions. After consultation with industry groups, it was publicly launched. Another example is the Serrated Tussock Strategy for Victoria.

The lowest order of weed species plan is at the property level. This plan is particularly useful for addressing enforced control situations, whether for eradication, for quarantine restrictions, or for management of well established weed populations. The last situation provides a dilemma for both the landholder and the regulatory authority. Tackling a well established weed with regular notices for incremental control is fraught with difficulties - it creates an antagonistic relationship, ownership of the problem remains with the authority, landholder is not motivated, landholder may not have the resources to do all the work, and timing is set by the authority and may not suit farm operations. This situation occurred for the control of *Harrisia* cactus in Queensland, using the mealy bug which must be collected and distributed. A scheme of property management plans for *Harrisia* cactus is now operational. A proforma has been developed and workshops are run to guide landholders through the process. Landholders use their own aerial photographs or are provided with a property map. A computer based record of the cactus distribution and planned actions is kept by the Department. The plan is formally approved, followed by the lifting of the control notice.

Weed management plans - comprehensive

State weed management strategies are the first order below the National Weed Strategy. All States and Territories except Queensland and Victoria are developing or planning to develop a state weed management strategy. The Tasmanian Weed Management Strategy, titled "WeedPlan" is the most advanced, being at the final draft/public consultative stage (WeedPlan 1995).

WeedPlan aims to co-ordinate and integrate the available weed management components to minimise the deleterious effects of weeds on the sustainability of Tasmania's productive and natural ecosystems.

These key components are:

- co-ordination
- roles and responsibilities
- resources
- quarantine and hygiene
- which weeds where?
- weed control measures
- legislation
- other plans
- monitoring and evaluation

The plan uses a creative approach of pictorially assigning each component to a jigsaw piece, with the pieces fitting together to form Tasmania. The jigsaw theme is continued through the plan. The plan addresses all ecosystems, terrestrial and aquatic (both freshwater and marine), and is a model for other States and Territories.

Below state plans are regional and local plans. The area basis for these plans may be defined in one of several ways [e.g. Tamar Valley Weed Strategy (WeedPlan 1995)] geographic [West Coast Weed Strategy (WeedPlan 1995)], biogeographic or administrative (e.g. local government, county council). In Queensland the planning focus is on the administrative unit responsible for declared pest control, that is, local governments. They are responsible for controlling declared pests on land under their control, inspecting private property, providing advice and ensuring control on private property. Local governments provide the resources for these responsibilities.

The Rural Lands Protection Act addresses pest plant and animal management and stock routes operations. Thus land protection planning involves a Pest Management Plan (weeds and pest animals) and a Stock Route Management Plan. The planning process is still in a developmental phase. A resource kit has been developed to guide a collaborative approach in each local government, involving elected and staff representatives and local Departmental officers.

Currently, each local government sends its annual budget funds to the Department, along with other levies, and the funds are returned on a claiming basis as work is performed. It is proposed to introduce annual Ministerial approval of local government pest management plans. Funds will not need to be forwarded to the Department under an approved plan, resulting in a shift of ownership and responsibility to local governments and administrative savings (in addition to the other benefits of planning).

While weed management planning is still in its infancy there are few, if any, regional/local plans on a different area basis which overlap i.e. a catchment plan overlapping an administrative based plan. If regional/local planning was taken to the ultimate, there would be three or four plans addressing any one area. This may require rationalisation, although catchment plans will tend to address a larger area than local government plans and thus

be a higher order plan. Flexibility should be retained with plans prepared only to address clear needs and objectives.

Property weed management plans are the next and lowest order. For private landholders, weed management would normally be incorporated into their overall property management plan. This order of plans also includes government agencies, local weed management plans e.g. Forestry, National Parks and transport corridors.

For well established weeds, these areas are sometimes a source of re-infestation for adjoining landholders, yet being State agencies, cannot be forced to implement control. It is proposed in Queensland, that these agencies be strongly encouraged to openly and collaboratively develop plans which balance stakeholder needs and resources, and which are consistent with the local government plan for the area.

QUEENSLAND INITIATIVES

In addition to Local Government Pest Management Plans and property single species plans (outlined above), the following programs are recent initiatives in Queensland. They address the principles and are proposed as major components of weed management towards 2000.

Potential weeds management

The Department of Lands has implemented a comprehensive approach to potential weeds (outlined in Csurhes and Bielby, 1994). In 1992, the position of Exotic Species Officer was established, with the primary responsibility of potential weeds management. Key activities have been:

Establish a database of potential weeds of Queensland. The database includes species not yet in Australia, in Australia but not yet in Queensland and in the early stages of establishment in Queensland. This database provides the basis for evaluation and decision-making on each species.

Declare species with the greatest potential impact to provide the power for immediate action if any are detected in Queensland, to prevent sale and to assist in promoting awareness.

- a) A procedure for reporting by herbaria, of any plant species which are identified for the first time in Queensland. The exotic species officer then investigates the species for its weed potential.
- b) Increase awareness of potential weed species and how they can be transported to Queensland. There is still much to be done to ensure that the right people are fully aware of even the key potential weeds and how to recognise a species they have not seen before.
- c) Conduct investigations of plant species and make control and policy recommendations based on their potential to be invasive weeds.

Pest status assessment

Pest status assessment is a process for maximising objectivity in decision-making and avoiding decision-making in response to special interest pressures. It is species based, with priority given to species where there is:

- a) a high level of uncertainty on future directions.
- b) a current or potential high impact on resources.
- c) high public demand for action

New declarations of weed species or significant changes to declarations now depend on completion of an assessment. An assessment is conducted by a team of staff with relevant expertise. They review published and unpublished information to provide a draft report which addresses:

- a) taxonomy
- b) biology and ecology
- c) current distribution and impact
- d) potential distribution and impact
- e) current management methods
- f) history of spread and management
- g) information gaps requiring research
- h) feasibility of preventing spread and other management options.

The process involves a workshop of the team to commence the review, and a workshop of the team with management to develop the recommendations based on the draft report. The final report is submitted to the Rural Lands Protection Board for advice on the recommendations and will in future be published as an internal report.

The pest status assessment then becomes the basis for development (or review) of the species policy and a state strategy for the major weed species.

Urban awareness of weeds

To address the principle of community awareness of weeds, Queensland initiated a three year project to address "Urban awareness of weeds" (funded by the National Landcare Program). The project originated from Land Protection Branch strategic planning and a Queensland Landcare Council Working Group. The project has resulted in a "Weedbuster" logo, a "Woody Weed" live character (costume worn by volunteer), an annual weed awareness week (or day), urban weed brochures and an extensive media campaign. The project will contribute to a weedbuster kit for schools (still to be developed).

In the lead-up to Weedbuster Day in 1995, staff were interviewed on radio programs and on prime-time current affairs television programs. The Weedbuster Day featured community groups in urban weed control.

Another component of the project has been focused on the sale of invasive plants by nurseries and their use by professional landscapers. A survey of weed awareness by nurseries has been completed by a consultant. Liaison with the nursery and aquarium

industries has been established. The Department will improve awareness by supplying brochures and articles to newsletters published by QNIA.

Policy development

Policy is defined in legislation, regulations and policies. Policies, which define what the government will do or require, and procedures or guidelines, which define how actions are to be done, are a part of quality management and a requirement under freedom of information. Previously, the requirements for declared weed management in Queensland were conveyed via the category of declaration and records of decisions made by the Rural Lands Protection Board. Policies are now being developed for each species, including species not declared, and for associated management issues, such as the level of required control. The policy development process involves consultation with field staff, an advisory Board (Rural Lands Protection Board) and a departmental management group before forwarding to the Minister for approval.

Strategic weed control

The Department of Lands commenced a strategic and preventative weed control program in 1992, as a three-year Treasury initiative. The funding of \$600,000 per year provided for six field staff, three vehicles and operating costs, primarily herbicides and diesel (for basal bark application of herbicides). The staff were based at three or more centres, with flexibility to assist on major projects as required. A project leader was responsible for managing the prioritisation of target species and the areas to be treated.

Objectives for weed species were established in line with Departmental policies - eradication of honey locust tree (*Gleditsia triacanthos*) and containment of other species by control of outlying infestations (e.g. prickly acacia, rubber vine, blue thunbergia). In addition, when Siam weed (*Chromolaena odorata*) was first detected in Australia, this program provided the core resources for an emergency response. The program has also supported potential weed management with control of barleria (*Barleria prionitis*) at Townsville and Senegal tea plant (*Gymnocoronis spilanthoides*) in South-east Queensland (in progress).

A feature of the effectiveness of this program has been its role as a catalyst for attracting other resources. Projects have used Australian Trust for Conservation Volunteers (ATCV), prisoners in work schemes, participants in employment and training programs, local government officers and landholders. This has been possible because the program provided the planning, supervision, consumables (herbicides, diesel) and equipment.

The strategic approach, combined with the benefits of local ownership of the activities and maximising the application of other resources, has proven successful. This success has led to a continuation of the program as a part of base funding and the commencement of a new three year initiative for \$1.5M per year.

Pestinfo

Pestinfo is a computer-based pest information system currently being developed by the Department of Lands. The objectives are:

- a) To have information on current pest distribution readily available for policy, planning, monitoring and impact assessment purposes (at all levels of scale from property to state-wide).
- b) To monitor changes in pest distribution (including the results of control programs)
- c) To provide an efficient system for recording field inspections.
- d) To use current pest distribution data to develop models of potential distribution.

At present, information is collected on an ad hoc basis by Departmental control services, extension and research staff, and by Local Government staff using a range of survey methods, and with no central collation. The information is thus difficult to access.

The first phase of this GIS-based project will allow field staff to record data using GPS co-ordinates (i.e. the weed infestation can be accurately mapped) or simply presence/absence at a property level. Staff will record data directly into a laptop computer in the field, and later transfer this to a central computer.

My vision of Pestinfo is that it will ultimately be an even more comprehensive system by including - all local government and other pest management plans, current control methods, summary of biology/ecology, Departmental policies, potential pests database, and Departmental species files (for limited access).

The system has the potential to greatly improve the efficiency and effectiveness of pest management, by quick access to information, improved corporate decision-making and improved local or regional decision-making.

ACKNOWLEDGEMENTS

The innovative weed management programs described for Queensland have been developed by many staff of the Department of Lands.

CONCLUSION

Weed management has changed a great deal in the last five years. It has been affected by external changes ranging from the rapid recognition of the importance of weeds in sustainable land use and nature conservation to the need for governments to be accountable (measured by efficiency, effectiveness, outputs and outcomes), the increased number and involvement of local community groups and changes in technology, particularly information technology.

Weed management is responding to these changes in a variety of ways, through planning, preventative weed management, strategic control involving community groups, mapping and information systems, and increased priority to environmental weeds. However, enormous challenges remain. Creativity, motivation, leadership and communication are required to develop new or improved components of weed management - many further changes are required in the next five years to 2000, if we are to achieve major progress towards sustainable land use and the conservation of biological diversity.

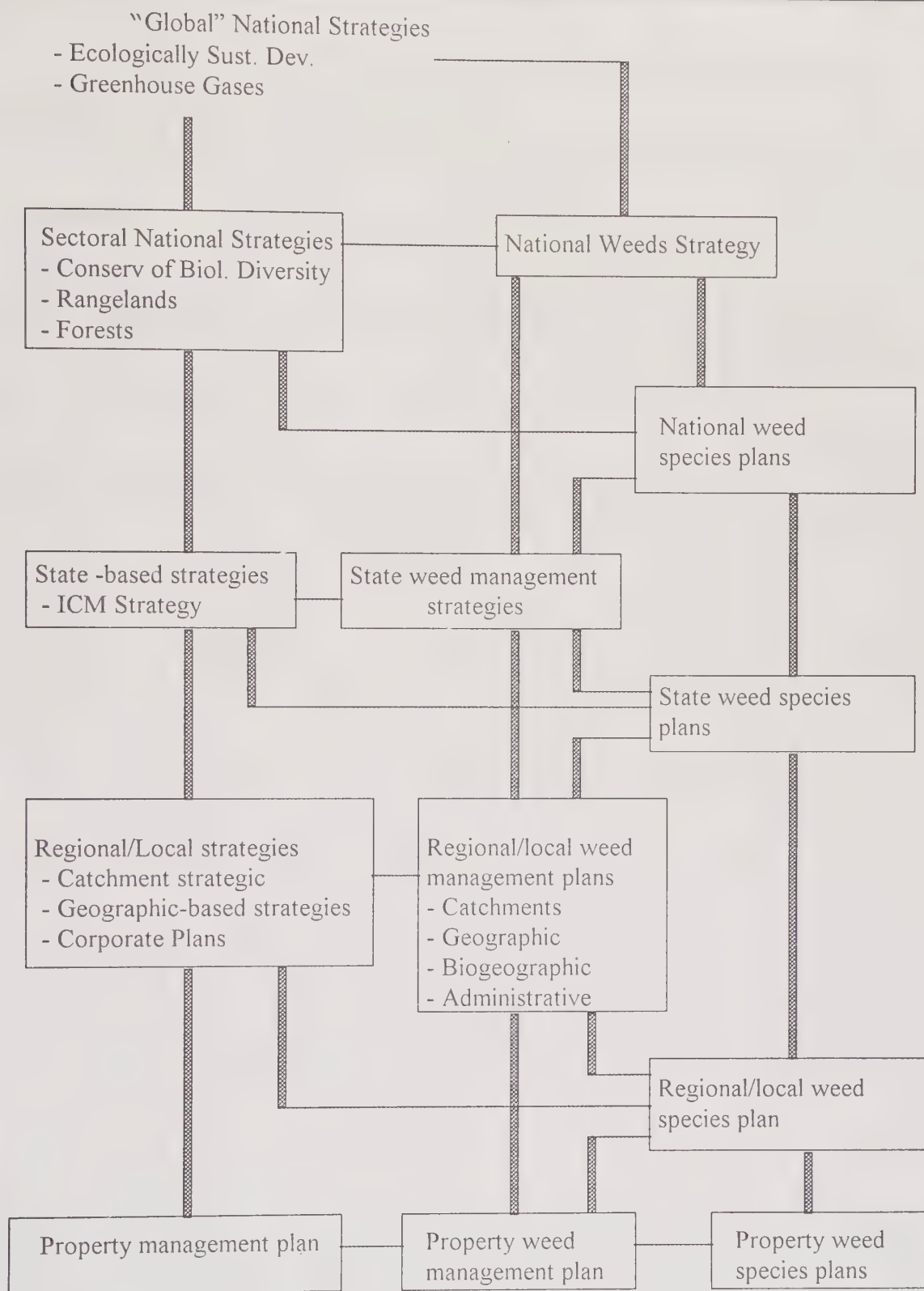


Figure 1: The scale scope and inter-relationships of weed management and natural resource management strategies/plans.

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**MANAGING VEGETATION IN AN URBAN ENVIRONMENT
ON A CATCHMENT BASIS**

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WINDSOR

Introduction

It can be argued that management of vegetation is important everywhere, but particularly in urban areas where human impacts are so dominant. In this paper, I shall outline a process that has been undertaken by the Hawkesbury-Nepean Catchment Management Trust to develop a framework for managing vegetation within the catchment - which includes not only urban environments but also peri-urban and rural environments.

The Hawkesbury-Nepean catchment covers some 25,000 square kilometres extending south from the Hunter Valley to Lake George and west from the Sydney basin to beyond Lithgow, and is home to about a million people. The river system draining this vast area is long and complex, comprising not only the Hawkesbury-Nepean but also the Wollondilly, Wingecarribee, Cox's, Colo and Macdonald Rivers and Mangrove, Mooney Mooney, Berowra and Cowan Creeks and their tributary streams. The vegetation types of the catchment are diverse, including forests, woodlands, grasslands, swamps and other wetlands, salt marshes amongst others, as well as those associated with our cultural heritage. The term vegetation encompasses also the great variety of plant species present in the catchment, together with the range of different communities that they make up that are found in a multitude of habitats, both wet and dry, from the mountain tops to the coastline and estuary.

In setting out any proposals to manage vegetation there are some obvious essentials:

1. The current situation and conservation of the vegetation need to be assessed, the current impacts determined, and whether or not management is needed.
2. Plans need to be made to conserve, restore and enhance the different vegetation types and plant communities and species within each type.
3. Everyone needs to be involved in the planning and decision making process.
4. Everyone needs to agree to act; resources need to be found and the action needs to be coordinated so that it is effective.

The Current Situation

Current vegetation status

It is estimated that some 65% of the catchment remains forested, but many of these forests are degraded in both structure and composition, and other parts of the catchment have been almost completely cleared. Figure 1 provides a very general perspective of the current status of vegetation cover within the Trust's area of responsibility (about half of the full catchment).

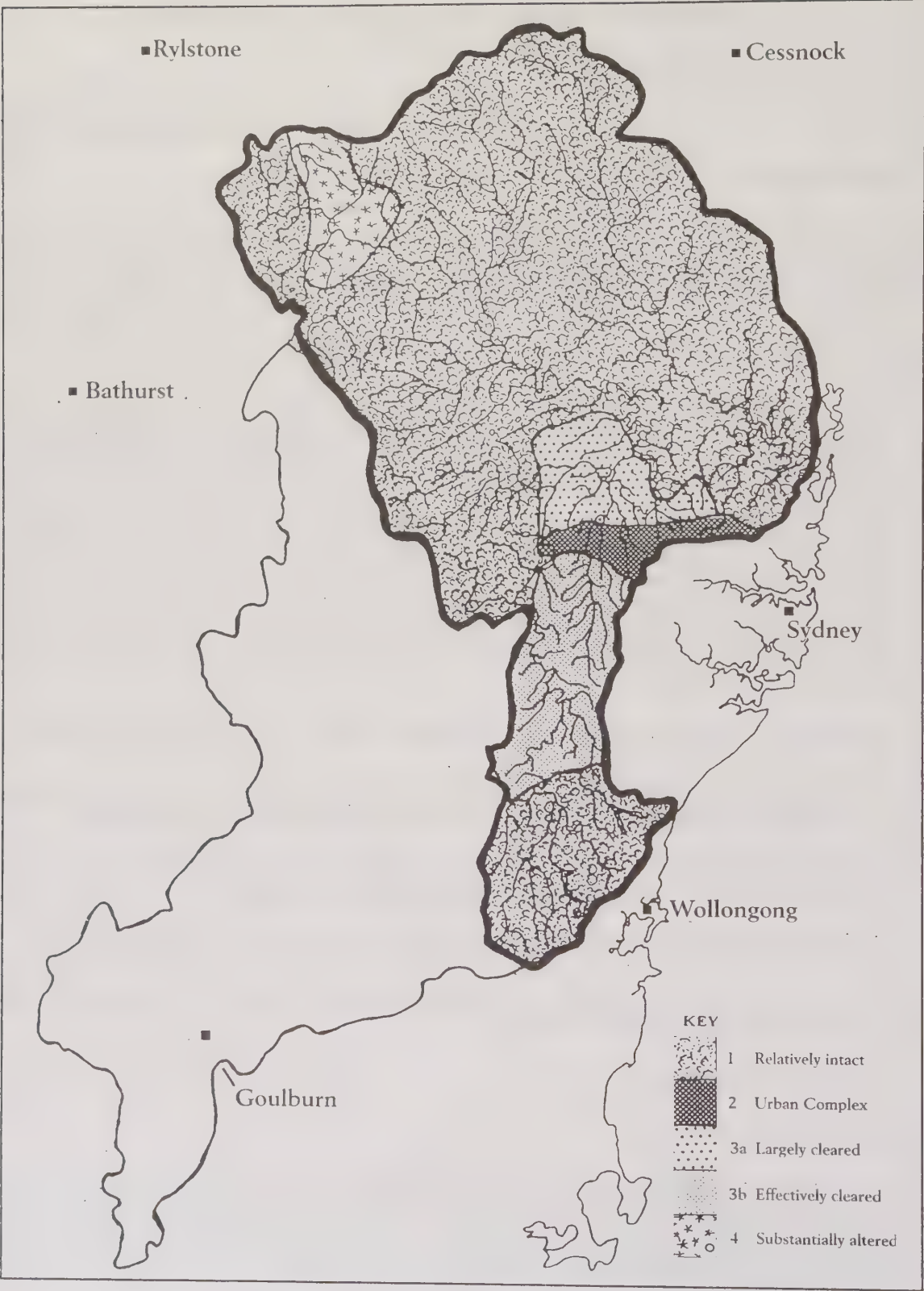


Figure 1 - Status of Vegetation in the Hawkesbury-Nepean Catchment

At one end of the spectrum we have the 'urban complex' where the original vegetation has been cleared, either for past agriculture or more recent urbanisation. Because the principal land uses of the fully developed urban areas are residential (houses and gardens), industrial, commercial and business, together with public infrastructure (provision of roads, drainage lines, power and Sewage systems, etc.) and open space (parks, playgrounds) the vegetation is often predominantly exotic, but there are a range of situations from that extreme to the urban-fringe situation where patches and corridors of remnant native bushland remain close to the urban areas.

At the other end of the spectrum is the "relatively intact" map unit; this includes the national parks, nature reserves and protected water catchment areas of the Hawkesbury-Nepean system with their range of native vegetation types. Much of the vegetation of this category has, in fact, been altered by changes in fire regime, by previous and on-going forestry and grazing, and some relatively large areas within it have been cleared for grazing. These are not indicated because of the map scale.

In between are the map units that indicate that vegetation has been "largely cleared" or "effectively cleared" for primary industry and more recently for rural residential purposes. The former indicates areas where there has been large-scale clearance of the understorey which has resulted in non-regenerating tree cover over semi-natural pasture; some intact remnant vegetation patches may be present. The "effectively cleared" map unit covers areas that retain very few remnants of the original vegetation and these are surrounded by highly altered landscapes such as improved pasture, plantation forestry and intensive agriculture.

It has also been well-documented that riparian areas are in a very degraded condition and many wetlands have been drained. Only a small percentage of the original vegetation types of the Cumberland Plain remain, and although there are a number of national parks within the catchment they are predominantly in sandstone areas and the full range of ecosystems (plant and animal communities and habitats) are not represented by the current system of parks and reserves.

Current impacts

Within urban areas the main impacts include further clearance or alteration of remnant bushland patches and vegetation corridors, with concurrent loss of biodiversity; the intrusion of exotic plants and weedy species into the remnants, and the effects of polluted water in stormwater run-off and sewage effluent. Domestic animals also impact on remnant bushland areas and on wildlife within them. Impacts associated with recreation and with the reduction of bushfire hazard are also important in all urban and peri-urban areas.

Clearance and fragmentation of larger areas of vegetation are probably the most important impacts in the peri-urban and more rural sectors and often lead to increased soil erosion and sediment transport in stormwater run-off. They also result in a loss of biodiversity and amenity, and enhanced greenhouse effect. On-site sewage disposal and agricultural practices (intensive livestock; erosion of river and streambanks) also adversely affect native vegetation in these areas. Direct and indirect exploitation of individual species affects the structure and composition of the plant and animal communities present and may result in changed habitats that allow weedy species and animal pests to establish.

Current management and management needs

Large areas of the catchment are owned by the state government and managed by state government agencies, and other by local government; some is the responsibility of the federal government and the remainder is in private ownership. Current management is based on a series of legislative and planning documents applicable at all levels: state, regional and local.

The public has a major role to play in the management of the vegetation resources of the catchment. They are the principal users and beneficiaries of the vegetation. The "health" of the catchment is dependent upon strong and viable plant communities as they support or influence many of society's effects upon the environment.

The Trust's role is in coordinating the management of natural resources within the catchment. The Trust's mandate is to:-

- a) encourage the protection, and where appropriate, restoration of the Hawkesbury-Nepean River system (within the defined Trust area),
- b) facilitate the ecologically sustainable use, development and management of natural resources, the floodplain and the built environment; and
- c) foster orderly and proper physical, environmental and socio-economic planning and management as a basis for the well-being of the people and all life within the catchment.

Why do we need to manage the catchment's vegetation?

Very simply - because of its great value to us. The values of vegetation are well documented: in urban areas plants improve parks, streetscapes and property values, and remnant natural vegetation provides living space, shelter and food for urban wildlife, an educational resource, protects soils from erosion and assists in controlling the quantity and quality of water reaching watercourses. In peri-urban and rural areas throughout the catchment vegetation also enhances scenic quality and amenity, provides a scientific resource and a range of tourism and recreational opportunities; provides shade and shelter for farm animals, habitats and corridors for movement of wildlife and reduces groundwater levels and salinity in groundwater. Plants provide us with a variety of crops, food for livestock, and many other useful products: food and drink, oils, gums and resins, timber, fibres, ornaments and medicines.

Vegetation also plays an essential role in maintaining the naturally functioning systems that ensure a balanced 'web of life' and through that, environmental health. When natural systems become unbalanced the costs are high; they are indicated by the costs of crop losses, of algal blooms, of public health risks. So it makes good sense to conserve and manage vegetation so that it continues to protect our land, to assist in the maintenance and improvement of the quality of our air and water, and to provide resources for the future.

But also, it is important to act now, because of the way we have used vegetation in the past and continue to use it. Vegetation is one of the catchment's main renewable natural

resources. But the amount of natural vegetation that has been lost over the past 200 years of European occupation, and that continues to be lost today through clearing and various other impacts, must be of concern to us all. That loss is now widely recognised as a significant cause of land and water quality degradation. It is essential that action is taken quickly to conserve as much of the remaining native vegetation within the catchment as feasible and manage it in a sustainable way.

Planning for management

How can we best conserve and manage the catchment's vegetation?

What do we mean by the terms 'conserve' and 'manage'? Both words embody the concepts of *careful use* and *protection and preservation* of resources. And these concepts are also embodied in the concept of 'total catchment management'. But also the great value of the community and government working together is recognised in this concept. Total catchment management (TCM) aims to achieve sustainability of natural resources through coordinated and cooperative management on a catchment basis.

To achieve sustainability we have to balance our use of resources such as water, soils, vegetation and biodiversity with their protection and preservation -- or, in other words, conserve our resources. Currently, we are using such resources at a faster rate than they can be renewed and we have to find ways in which we can redress the imbalance. We also have to reduce the adverse effects that many of our activities have on the environment.

By everyone learning more about the different types of vegetation in the catchment, understanding their value and working together, we are more likely to ensure that the vegetation resource is retained, and where necessary restored and enhanced for future use and enjoyment.

Why a catchment base?

We all live in a catchment - defined as the land area from which water drains to a common watercourse - and this is a good natural unit with clearly defined boundaries to think about when considering how best to use our land and water and manage our vegetation resource. One of the main values of considering vegetation on a catchment basis is that it promotes a broader view and consideration of others. Catchment aspects are important - whatever is done at the head of the catchment will affect the bottom; impacts on upstream areas will affect downstream areas and so on. While individual plant species, communities and vegetation types are often widely distributed, crossing many different catchment boundaries, their local distribution often relates to topographic position (ridges, slopes, valley floor or floodplain), to aspect (east, north, west or south-facing slopes), to specific soil types (gravelly, sandy, clayey or humic soils), or ground water table levels (low, high).

Also, when planning further development for urbanisation of vegetation for other purposes catchment landscape aspects and plant community distributions should be considered - what areas need to be conserved or protected, eg. ridgetops and steep slopes because they have highly erodible soils, wetlands and riparian vegetation because of their ability to assist in the control of water flow and value in improving water quality; a range of

vegetation types to provide for plant and animal diversity, and for recreational purposes and so on. The geographic base of the catchment remains useful as a descriptive unit.

Involving Everyone

The participatory process

From mid-1994 the Trust has been coordinating the development of a framework for managing vegetation within the catchment using a participatory process. A steering committee was formed comprising representatives of state and local government authorities and community representatives. It ran a series of workshops to gain an understanding of the key issues affecting vegetation in the catchment and to develop the framework for a management strategy. The workshops involved some 60 people representing the community, government agencies, local government, environmental groups, local interest groups and individuals with experience relevant to the management of the aquatic and terrestrial vegetation of the catchment.

Setting a goal

The framework was designed to provide a set of identified policies, aims and actions that would encourage consistency in planning and improved management of terrestrial and aquatic vegetation throughout the catchment. It is essentially a framework that allows for the development of more detailed and specific plans relevant to all areas of the catchment.

The agreed goal for the catchment's vegetation is:

For the community to retain, rehabilitate and manage vegetation which protects plant and animal species diversity, soils, water quality and public amenity and ensures the maintenance of ecological processes.

Priority issues

The key conservation and management issues that were identified were the need to conserve and manage nature, land and water, but also the need to consider social and economic aspects. It was recognised that all these aspects had to be integrated if sustainability was to be achieved. The framework included under each of these key issues a series of policies, aims and actions. These were defined as follows:

Policy	a course or general plan of action adopted and pursued
Aim	that to which action is directed; to seek to attain
Action	the work to be done; the process of acting or influencing

The various actions were linked to both a timeframe (within 2-3 years, 4-6 years, ongoing) and to stakeholders: those authorities with both statutory responsibilities and advisory roles. Local government and non-government organisations, specific interest and other community groups, and individuals all have a role to play in the implementation of the framework.

Those participating in developing the framework considered it was essential to retain and restore areas of conservation value throughout the catchment for protection of land and

water, to conserve plant species and their genetic diversity, together with a full range of vegetation types and their habitats; and to attempt to reduce human impacts which adversely affect the vegetation. It was agreed that in order to do this: information of the current status of the catchment's vegetation needed to be collated, the pressures being exerted upon it identified and responses to those pressures developed. Sound management practices for the various land uses within the catchment needed to be developed and implemented as they would be of value to everyone. Implementation of the improved management practices could be encouraged through direct economic incentives. A sense of responsibility for vegetation management and increased community involvement in that management was needed; increased information about the vegetation resource in the catchment and its value would assist in developing these aspects.

It was believed that improvements in the catchment's vegetation and environmental quality will also have follow-on effects, such as providing increased recreational opportunities and enhanced heritage values and employment opportunities as well as increased economic returns for all involved in using the land.

Public consultation

The Trust endorsed a draft vegetation management strategy in late September 1994 and the document was initially circulated to government agencies and councils for consideration and comment, and revised in the light of their comments prior to being released for broader public comment. The framework document, together with an informative brochure, was published in April 1995 and placed on Public Exhibition until 31 July 1995. Copies were exhibited at Council Libraries, local offices of state government agencies and at Catchment Management Committee (CMC) offices as well as at the Trust office. Advertisements were placed in local papers calling for comments and giving dates of public meetings. Both were also made available at the Trust's Public Forum in early May.

Seven meetings held throughout the catchment during June and July provided the opportunity for presentation and discussion on the vegetation management framework, and the community were encouraged to submit their comments on the draft to the Trust. Attendance at all meetings was very good and the discussions lively. Notes were taken at each of the meetings of the comments, concerns and issues raised. Some 48 submissions based on the brochure and 57 written submissions on the full document were received, the latest in October, 1995.

Revising the framework

The comment received were collated and the draft framework reviewed in light of them. All contributions were welcome and given due consideration. Generally, the submissions were favourable indicating support for the process, and the comments and suggestions made were helpful and constructive. A summary report of the submissions entitled 'What you said: report on community consultation on *Time for Action: Draft Framework for Vegetation Management in the Hawkesbury-Nepean Catchment*' has been published and is available from the Trust.

The framework has been revised on the basis of all comments received. Almost all duplication has been removed and suggested actions are now grouped into related series

under a few main aims and policies, namely those perceived as having priority by the community. Stakeholders have now been included under the aims rather than the actions (again reducing duplication) and timeframes have also been left out of the revised document as priorities will vary from one part of the catchment to another. It is important that timeframes are not forgotten when developing more detailed action plans for specific areas, as they provide a way of setting priorities. Experience indicates that it is important to meet priorities and very satisfying to achieve results within a certain timespan, especially when projects may run over a number of years.

The framework is divided into two parts: conservation and management of the vegetation resource, and social and economic aspects. The policies in the first section include:

- ☐ Provide accurate up-to-date information to the community on all aspects of vegetation and its conservation within the catchment.
- ☐ Conserve the diversity of indigenous vegetation types, plant communities and species throughout the catchment.
- ☐ Conserve the health and viability of aquatic ecosystems through the maintenance of the catchment's vegetation.
- ☐ Provide a comprehensive and consistent body of legislative and management controls to conserve vegetation.
- ☐ Vegetation conservation and management issues to be fully addressed in land use planning and development processes.
- ☐ Provide comprehensive and coordinated conservation of the catchment's vegetation.
- ☐ Increase information on vegetation within the catchment.
- ☐ Coordinate vegetation studies and activities through improved monitoring and reporting back to authorities and the community.

The policies in the second section include:

- ☐ Increase the involvement of the many different sectors of the community in vegetation conservation and management.
- ☐ Recognise that vegetation and its management are important components of the cultural heritage of the catchment.
- ☐ Recognise and promote vegetation and its conservation as economically beneficial.
- ☐ Increase the effectiveness of funding and services relating to vegetation management in the catchment.

A number of the submissions the Trust received to the draft framework indicated a desire for much more detailed action plans to be provided. This is considered inappropriate within a framework document which is designed to provide a more general base that will allow for flexibility of approach when developing more detailed plans and actions to address specific and local issues. The framework is only one part of the process and has to be implemented.

Getting Action - Implementing the framework

The final part of the process is to get some action, that is, to implement the policies and actions outlined in the framework. The Trust has recently agreed to publish the framework document and make it widely available. To assist in the implementation of it, the Trust is encouraging and coordinating the preparation of a variety of guidelines that will provide

more details on how to undertake many of the series of actions suggested within the framework, and has also coordinated the preparation of some resource documents. These will be published when completed and will be available at the Trust and Catchment Management Committee offices.

How can the framework and associated documents be used?

As well as providing a set of catchment-wide policies, aims and actions that will encourage consistency in planning for the conservation and management of vegetation, the framework and associated resource and guideline materials can be used in many other ways. They will provide a sense of direction to decision-makers and the community and a forum for involving the whole community in promoting positive action and change in managing the vegetation resource. In setting courses of action there can be consistency of approach and cooperation between all parties involved; individuals, groups, councils and government agencies can work together. Positive changes will result with an increase in community support and commitment.

Decision-makers will have a list of potential priorities for management within local areas and a sound basis for deciding which areas of vegetation should be conserved, which further areas could be cleared without damaging flora and fauna habitats and reducing biodiversity, and which areas are most in need of rehabilitation. The framework and guidelines may be examples that can be used in other catchment areas.

The framework and associated documents will also provide a basis for: increasing awareness of the value of vegetation amongst the community; the development of more integrated and efficient management controls; coordinating vegetation management between departments within councils, agencies and other multi-purpose organisations; and developing cooperative vegetation management programs with neighbouring councils. There can also be increased accountability. The framework and guidelines will provide a basis for setting performance standards, for increased effectiveness of existing control mechanisms, and a yardstick against which to measure change.

The resource documents will assist in answering public inquiries, in developing applications for funding of surveys, rehabilitation and regeneration projects, and provide reference material adapted to suit specific local areas.

Who can use these documents and act? - the stakeholders - who are they?

Everyone who is involved with the catchment: individuals whose activities impact on the catchment's environment, landholders, community groups who have an interest or work within the catchment, those who focus on conservation of heritage or flora or fauna, on recreation or education within the catchment, industries and businesses, and the many authorities, non-governmental and governmental who have advisory and/or legislative responsibilities within the catchment.

Individuals can be active in vegetation management. We can appreciate the colour, form, size and shape and the enormous variety of our Australian plants, plant communities and vegetation types and assist by replanting trees, shrubs, and smaller ground-covers locally to bring back the bush and attract native birds and other wildlife. The loss and degradation of the local and catchment vegetation will affect many of our own activities so we may

become involved by attending public meetings where vegetation issues are discussed, or by writing letters to decision-makers about our concerns.

There are many different non-governmental and groups in the community that are interested in the conservation of vegetation in the catchment: the environmental groups, the bush regenerators, Streamwatch groups, Trees for Rotary, Men of the Trees, Progress Associations and the various Volunteer groups amongst others. All are playing and will continue to play a very important role in the retention, rehabilitation and enhancement of the catchment's vegetation.

The industrial and business sectors are extremely important to vegetation management in all areas of the catchment. They have a role to play in improving general amenity on their own properties through rehabilitation, and can assist with experimental and demonstration sites, in broad-scale education, and in developing new plant products.

Local government is the closest level of government to the community. Much of the conservation and sustainable management of the catchment's vegetation lies in their hands. Local councils, in carrying out their own activities and in directing those of others, are very much a key player.

The Federal government owns significant areas of the catchment. The framework provides the Federal government with an outline for vegetation conservation and management for their own lands. It also provides a basis for Trust and community submissions on Federal government initiatives.

There are many State government agencies involved in the overall management of vegetation in the catchment. There are the obvious ones such as NSW National Parks and Wildlife Service, the Department of Urban Affairs and Planning, and the Department of Land & Water Conservation. But there are also many others that have direct or indirect responsibilities in vegetation management and these are listed in the framework document; all can be involved in the implementation of *Time for Action*, providing advice, information and assistance in developing more detailed action plans.

The Trust in its role as a catchment manager will use the framework document as a basis for encouraging improved management of vegetation. It will actively promote the framework's implementation with all stakeholders and will itself undertake many of the actions listed. It will coordinate a number of the aims, especially those relating to the collation and maintenance of up-to-date information, will promote vegetation surveys and research programs and the development of monitoring programs. It will seek to work in partnership with other stakeholders, will facilitate cooperative effort through workshops, seminars and discussion groups, and publish and distribute widely relevant resource information and guidelines for improved management practices. The Trust has a role also in assessing revegetation, other remediation and educational projects that seek funding from a variety of sources. The framework provides the Trust and the community with the type of proposal that it will support in funding applications. The Trust's catchment management committees, with local knowledge and expertise, have a central role to play in assisting community groups with planning and implementation of on-the-ground projects.

Implementation and feedback

The Trust coordinated the development of the framework through consultation and community participation to provide a consistent base for planning and action across the catchment. The Trust invites everyone to use the framework, to implement the policies and actions within it, and where necessary to develop more detailed plans and actions relevant to specific areas within the overall context of the framework.

The Trust will be seeking feedback on the usefulness of the framework and associated resource and guideline documents being produced. These documents are not 'set in concrete' but rather ones that can be continuously added to, and reviewed and revised in the light of comments and experience. The framework document is considered to be just a small, but basic, contribution in a long-term process that will attempt to meet the catchment community's goal for vegetation.

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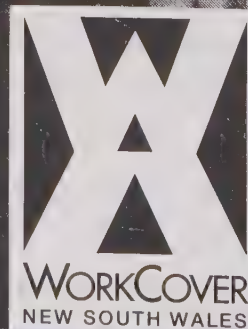
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AN ENHANCED WEED MANAGEMENT PROGRAM FOR NSW NATIONAL PARKS

**Andrew Leys, Coordinator Pest Management
NSW National Parks and Wildlife Service**

Introduction

New South Wales has an extensive system of conservation areas such as national parks, nature reserves and wilderness areas with a total area of approximately 4 million ha. Under the National Parks and Wildlife Act the National Parks and Wildlife Service has a statutory responsibility for the management of these areas and for the protection and care of nature, and Aboriginal and historic heritage throughout New South Wales.

The goal of the Service's weed control programs is to manage populations:

- * to reduce their impact on native flora and fauna, and
- * to minimise their spread onto neighbouring properties.

Humphries et al (1991) have defined environmental weeds as those that cause major modification to species richness, abundance or ecosystem function. Other definitions include species which have, or have potential to have, a detrimental effect on economic, social or conservation values of an area.

At a recent workshop to develop the NSW Weeds Strategy there was considerable debate on whether environmental weeds should be considered as a separate entity, or whether they should be treated the same as other weeds. I could agree with the latter argument, if environmental weeds were being treated the same as other weeds. Unfortunately they are not. The emphasis on declaration, and hence enforced action for the community's good under the Noxious Weeds Act, is on agricultural weeds. The Strategy needs to ensure that there is adequate research on environmental weeds, and that additional funds need to be made available to implement effective control programs.

New directions

Weed management on Service estate received a major boost last year with the announcement that funding for pest management (animal pests and weeds) will increase to a level of \$5 million per year by 1997/98. The funds will be used to appoint District staff with specific responsibilities for pest management. Funds provided under the package will also be used to provide resources for District weed control programs.

Already 28 staff have been appointed to the districts, while my position has been created in Head Office to coordinate the development and implementation of the district programs. During 1994/95 the Service has undertaken 146 weed control programs. This obviously involves a wide range of species including well known noxious weeds of agricultural areas, such as serrated tussock (*Nassella trichotoma*), and blackberry (*Rubus fruticosus*), as well as species specific to conservation areas such as bitou bush (*Chrysanthemoides monilifera*), privet (*Ligustrum* spp.), Madeira vine (*Anredera cordifolia*) and bridal creeper (*Myrsiphyllum asparagoides*). Emerging weed problems such as Mysore thorn (*Caesalpinia decapetala*), willows (*Salix* spp.), Easter cassia (*Senna pendula*) and glory lily (*Gloriosa superba*), also have to be addressed.

One of the major problems in planning weed management programs for environmental weeds is that there are no recognised criteria to assess their environmental impacts: existing information is mainly descriptive. However, the Service is in the process of developing a process which will allow weed problems to be objectively assessed. In this way we will be able to make more efficient use of the resources available.

Key programs are discussed in the following section.

Bitou bush

A cooperative program involving landholders, local community groups, NSW Agriculture and universities, is being undertaken to ensure an integrated approach to controlling bitou bush is adopted on Service lands. This includes release of biological control agents, when available, herbicides (by Service staff, contractors and volunteers) and removal by hand where that is possible.

The Service also allocates approximately \$50,000 per year towards the national program on biological control of bitou bush. This program is coordinated by Standing Committee on Conservation's Task Force on Weeds of Conservation Areas. It includes research being undertaken overseas and in Australia by CSIRO Division of Entomology, the Victorian Department of Conservation and Natural Resources and NSW Agriculture.

The bitou tip moth (*Comostolopsis germana*) has now been released at over 50 sites in New South Wales, many of these on Service land. (eg Yuraygir NP, Sea Acres NR, Booti Booti NP, Wyrribalong NP and Botany Bay NP). Two new agents the bitou tortoise beetle (*Cassida* sp.) and the bitou seed fly (*Mesoclanis polana*) are planned for release later this year and most of the releases will be on Service land (eg Yuraygir NP, Myall Lakes NP and Botany Bay NP). In all cases Service staff are working closely with NSW Agriculture to select the most appropriate sites and to assist with monitoring establishment of the agent and its impact on bitou bush.

Although bitou bush is only declared a noxious weed in 4 local government areas outside the Sydney Metropolitan Area Service staff have developed, or are developing, management plans to control it on most of our parks and nature reserves. This usually involves the use of glyphosate applied as a cut-stump treatment (scattered plants in amongst native species), or as a foliar spray where monocultures prevail. The area infested with bitou bush has been reduced substantially in some parks and reserves (eg Broulee Island Nature Reserve) although in most cases the infestations are so widespread that a containment program combined with a progressive reduction plan is the only feasible management strategy (eg Yuraygir NP).

The NPWS is also working closely with NSW Agriculture research scientists to evaluate the effectiveness of aerial applications of low rates of glyphosate (2 L/ha of product). Preliminary research by these scientists shows that when applied at these rates during winter, glyphosate is very effective on bitou bush and is well tolerated by native species (so far over 80 species of native plants have shown tolerance to glyphosate). Staff are also closely involved with research being undertaken by the School of Biological Sciences at the University of Wollongong (Professor Rob Whelan) which is monitoring the impact of this control technique on native flora and fauna.

In addition Service staff are attempting to foster volunteer bush regeneration groups for most areas where bitou bush is a problem.

Groundsel bush

Groundsel bush (*Baccharis halimifolia*) is an important weed in many coastal areas of New South Wales, especially the North Coast. It thrives in saline, semi-tidal conditions to readily colonise coastal swamps and forests which have been disturbed by fires, floods or human activities. Until recently groundsel bush infested large areas the Yuraygir and Bundjalung National Parks and nearby nature reserves, where it competes with native plants, often replacing them completely. Jeff Thomas, NPWS Pest Management Officer at Grafton, has coordinated the groundsel bush control program in the Grafton area. Over 1,100 ha of groundsel bush has now been treated, and many of the areas are now free of the weed. A more detailed paper on this program has been written by Jeff, and appears elsewhere in these proceedings.

Scotch broom

Scotch broom (*Cytisus scoparius*) is very competitive with native species and can exclude many understory species. The seed has considerable dormancy and can survive in the soil for many years to germinate given favourable conditions.

Scotch broom is a serious threat to the integrity of plant communities in a number of conserved areas. The largest infestation occurs in the Barrington Tops area, although other major infestations occur in the Central and Southern Tablelands with scattered infestations in Kosciusko National Park.

The Service is currently developing management plans for each of its parks in which Scotch broom occurs. This will involve the use of herbicides and biological control agents, and in some instances, physical removal.

The Service has continued to contribute to the cooperative program for biological control of Scotch broom. The program is also supported by NSW Agriculture, CSIRO, State Forests of NSW and the Hunter Pastoral Company. Recently a major grant has been provided by the NSW Environmental Trusts.

Already two agents, the broom twig mining moth and the broom psyllid, have been released. Scientists plan to release another agent, *Bruchidius villosus*, later this year.

Serrated tussock

The NPWS is cooperating with NSW Agriculture, local government councils, Landcare groups, catchment management committees and agribusiness in a major campaign on serrated tussock (*Nassella trichotoma*). The aim of this campaign is to develop a strategic approach to the control of this weed. The Service also contributed towards an international survey for potential biological control agents for serrated tussock which has recently been undertaken in Argentina.

Bushland regeneration programs

The NPWS is also working closely with volunteers to help regenerate bushland in many of our national parks. Some of the most active programs are in the Sydney Metropolitan area. Volunteers regularly work with the Service helping to remove many weeds including bitou bush, lantana (*Lantana camara*), privet (*Ligustrum* spp.) balloon vine (*Cardiospermum grandiflorum*) and wandering jew (*Tradescantia* spp.).

The North Metropolitan District has a very active bush regeneration team headed by Coordinators, Lynn Rees and Richard Colbourne. Lynn and Richard have established more than 35 groups with a total of more than 300 volunteers in the Lane Cove, Garrigal and Kuringai Chase National Parks. Such volunteer programs contribute enormously to the Service's weed control effort. The Coordinators have estimated that the value of the labour for a recent 12 month period is worth more than \$240,000. An excellent newsletter (*Regenavitis*) has been produced, as well as several weed technical sheets: regular training workshops are held for the volunteers. The team has been successful in obtaining a major grant from the Urban Rivers Reborn Program to help support this work.

The Sydney and South Metropolitan Districts have smaller, but similarly effective volunteer programs operating in the Sydney Harbour, Botany Bay and Royal National Parks. Successful volunteer programs also exist in many other parks.

Rainforest weeds

Seventy five percent of the rainforest present in Australia at the time of European settlement has now been cleared. Much of what remains is fragmented and subjected to disturbance by fire, desiccation and increased light penetration (Humphries *et al.* 1991). The Service will be undertaking rehabilitation works in rainforest remnants occurring within 13 Nature Reserves in the Lismore District (Joseph 1995).

The philosophy adopted in this program is that effective rehabilitation of native plant communities requires an integrated approach based on a thorough understanding of the rainforest ecosystem. While weed control is a vital component of such a program, the aim is to replace all weeds with native species in such a way that the process of natural regeneration and succession is sustainable. This contrasts with the more traditional approach of selectively targeting control programs towards individual species.

In the Boatharbour Nature Reserve 23 weed species were identified with the most common species being Madeira vine (*Anredera cordifolia*) and wandering Jew (*Tradescantia albiflora*). The presence of Madeira vine poses the most serious threat to this reserve and it will require a long-term weed control program to reduce the area infested and then to maintain it at manageable levels. The eastern portion of this Reserve is particularly degraded and is the major source of spread because of its upstream position. Wandering Jew poses a further threat because of its density which restricts the germination and establishment of native species. Most of the remaining weed species are more limited in their distribution and abundance. However, they have the potential to increase unless appropriate management strategies are adopted (Joseph 1995).

In the Brunswick Heads Nature Reserve 56 weed species were identified and their importance varied with habitat. Important species include bitou bush (*Chrysanthemoides*

monilifera), lantana (*Lantana camara*), Cape ivy (*Delairea odorata*), coral berry (*Rivina humilis*), climbing asparagus (*Protasparagus plumosus*), ground asparagus (*Protasparagus aethiopicus*), Madeira vine (*Anredera cordifolia*), glory lily, coastal morning glory (*Ipomoea cairica*), camphor laurel (*Cinnamomum camphora*), common morning glory (*Ipomoea indica*) and fishbone fern (*Nephrolepis cordifolia*).

Mapping weed distributions

The Service is developing a database to record and map the distribution of important weed species. Apart from the rainforest remnants project discussed previously, other mapping programs underway include groundsel bush in the Yuraygir and Bundjalung National Parks and Scotch broom in the Kosciusko National Park. Staff will also be combining with NSW Agriculture and local government councils to re-survey the distribution of bitou bush throughout New South Wales.

Conclusion

The NSW National Parks and Wildlife Service is substantially increasing the human and financial resources it allocates to weed management. The Service is keen to collaborate with local government councils and other public authorities to ensure weed control programs are better planned and implemented.

Acknowledgments

Several colleagues contributed towards this paper and I acknowledge the help of Rosemary Joseph, Samantha Olson, Jeff Thomas, Lyn Rees, Mike Dodkin and Rus Knutson.

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OR CONTACT:

LICENCES FOR HERBICIDE USE IN OR NEAR WATERS

Jane Mallen-Cooper
Waters & Catchments Branch
NSW Environment Protection Authority

INTRODUCTION

Public and private landholders are legally obliged to control noxious weeds under the *Noxious Weeds Act 1993*. The use of herbicides to control noxious and other weeds is central to most weed control programs. Ideally, it forms part of an integrated suite of techniques carried out on a catchment basis (the principle being that if you have put a lot of resources into weed control in a certain area, it is undesirable to have your treated areas reinfested from elsewhere in the catchment).

People involved in weed control activities need to be aware of certain legislation administered by the EPA, particularly the *Clean Waters Act 1970* which contains provisions to prevent or minimise water pollution. In addition, the EPA will soon be responsible for administering the *Pesticides Act*. However, because the transfer of the *Pesticides Act* from NSW Agriculture to the EPA is not yet completed, I am going to focus on water pollution control today.

At the end of the talk, I hope you will:

- * have some understanding of the relevance of the EPA legislation, particularly the *Clean Waters Act*;
- * know whether an EPA licence is needed for the spraying of herbicides to control noxious or other weeds; and
- * understand how the EPA is addressing your key concerns in relation to the draft *Licensing Guidelines for Herbicide Use In or Near Waters*.

EPA LEGISLATION

So how are your weed control activities affected by the EPA legislation?

The Act which has significant implications for the weed control industry is the *Clean Waters Act 1970* and its associated Regulations (*Clean Waters Regulations 1972*).

Section 16 (1) of the *Clean Waters Act* states that "a person shall not pollute any waters"! In this context, waters encompass anything from pristine lakes, rivers and wetlands to drains. Pollute is defined as "to place in or on, or otherwise introduce into or on to, the waters...any matter...so that the physical, chemical or biological condition of the waters is changed..., and you are deemed to pollute if you "place any matter...in a position where...it falls, descends, is washed, is blown or percolates [or is likely to do so] into any waters..."

Thus the direct application of herbicides to waters, or to adjacent lands where they might "fall, descend, wash, blow or percolate" into waters, is pollution as defined by the Act.

And as a note of caution, pollution as defined by the Act could also apply to the sedimentation of water courses as a result of mechanical removal - so it is important not to expose large areas of bare soil during weed control activities. Soil conservation measures may be needed to prevent large volumes of soil from washing into drainage lines.

Penalties for polluting waters can be substantial, and are set out in the *Environmental Offences and Penalties Act 1989*. The maximum penalties are \$1 million for corporations and \$250,000 and/or 7 years imprisonment for individuals, where wilfulness or negligence is evident and significant harm has been occasioned to the environment. More commonly, penalties range from \$600 for a minor infringement to \$50,000-\$100,000 where serious environmental harm has been occasioned, but wilfulness is not involved.

LICENSING

In the last few years, (probably particularly since the introduction of the *Environmental Offences and Penalties Act*), there has been increasing interest in the whole area of EPA licensing in relation to herbicide application activities.

In particular, local government councils, council employees and other weed control operators have become concerned that they could incur severe penalties under the *Environmental Offences and Penalties Act 1989* should they pollute waters as a result of herbicide use.

Some local authorities have also become concerned that third parties may seek court orders under Section 25 of the *Environmental Offences and Penalties Act* to restrain activities such as herbicide application which could be seen as potentially harming the environment. Such actions could significantly interfere with weed control operations, and thus these local authorities have sought the "protection" of a pollution control licence.

So, should all herbicide application activities be licensed?

The short answer is no.

In the majority of cases (for example, the spraying of weeds along road verges, in farm paddocks or in parks and reserves where the weeds are not immediately adjacent to water), the EPA considers that a licence is unnecessary because the pollution of waters can be prevented by carrying out weed control programs in an environmentally responsible way - this is often referred to as the "due diligence" approach.

i.e. it is the responsibility of everyone involved in weed spraying operations to exercise due diligence and thereby prevent pollution of waters.

Exercising "due diligence" involves the implementation of widely-understood and practical techniques such as:

- * only using herbicides which the container label states are registered for the particular weed species and location in question (e.g. diquat is registered for the control of *Salvinia* in waterways);
- * applying herbicides strictly in accordance with directions on the registered label;

- * applying herbicides in accordance with "best management practices" as specified in the national *Guidelines for the Use of Herbicides In or Near Water* (1985) or any other EPA-recognised guidelines or codes of practice;
- * ensuring herbicide users are fully trained in the proper use of herbicides (e.g. the Farm Chemical Users Training Program);
- * ensuring that any observed impacts resulting from the use of herbicides are reported immediately to the EPA and dealt with quickly to minimise environmental harm; and
- * where practicable, co-ordinating weed control activities within catchments.

However, in some circumstances (for example the spraying of aquatic weeds) the pollution of waters is unavoidable. Even if you follow all best management practices, you are going to pollute waters as defined in the Clean Waters Act.

In these cases, the EPA would recommend obtaining a licence. The licence will contain conditions which aim to minimise harm to the environment.

Providing all licence conditions are followed, a licence is a protection against prosecution. Section 16 (6) of the Clean Waters Act states that "it shall not be an offence arising under those provisions for a person to pollute any waters if he holds a licence and does not pollute the waters in contravention of any of the conditions of the licence".

To be granted a licence, a weed control operator would need to provide information regarding:

- * weed control planning - proposed spray locations, proposed times of spraying, types of herbicides to be used, target species, proposed method of application, likely environmental impacts, monitoring provisions; and
- * justification of the use of the herbicide. This is necessary to demonstrate that this is the best available control option, and will have the least overall environmental impact.

You supply this information with a form available from all EPA regional offices.

If the EPA accepts the application, the individual or agency is granted a licence under the *Pollution Control Act 1970*. This Act sets out the mechanisms and details for granting and administering licences and the rights of appeal in relation to licences. The EPA would grant a licence providing it was satisfied that the need to spray was essential and gave the best outcome, that best practice would be followed and that registration and provisions of the Pesticides Act would be complied with.

Licences have conditions attached to them. These need to be followed in all weed control operations. For example, a licence might specify the type of monitoring that would be required, or the procedures to follow in the event of a pollution incident.

LICENSING GUIDELINES

The EPA position on licensing is set out in the draft Licensing Guidelines for Herbicide Use In or Near Waters. This document was sent in mid-January 1995 to a wide range of stakeholders (e.g. all local councils, weeds county councils, Rural Lands Protection Boards, relevant government agencies, peak industry and conservation groups). About 50 submissions were received between January and July, and I'd like to take this opportunity to thank everyone here who made a contribution.

While most people were supportive of the draft guidelines in principle, many complex issues were raised over a broad range of subjects, and many (often conflicting) points of view were expressed.

What I thought might be useful is for me to list the most commonly raised issues from the submissions, and then discuss our current thinking about these issues.

1. Perceived conflict between the Noxious Weeds Act, aspects of pesticide registration and the Clean Waters Act

The Noxious Weeds Act makes it a legal responsibility to control noxious weeds on both public and private land. The Clean Waters Act ensures that you control the weeds in a manner that prevents or minimises the pollution of waters. These are complementary roles, given that the Clean Waters Act does not prohibit appropriate herbicide use.

Registration, previously under the Pesticides Act and now predominantly under the Commonwealth legislation (Agvet Code 1994), takes into account the effects of a particular chemical on human health and the environment. However, registration alone could never guarantee total chemical safety in the environment. For example, the registration process cannot really address cumulative impacts (e.g. using a number of different chemicals in the same catchment or subcatchment and impacts which arise from continued and extensive use of a herbicide) or the relationship between herbicide use and catchment condition (e.g. in relation to soil loss and runoff, availability of buffer strips, depth of the groundwater) - these all need to be looked at on a case by case basis for the best environmental result. Similarly, the sensitivity of the receiving environment needs to be considered (e.g. rare species), and it must be remembered that much of the ecotoxicological data is based on a limited range of species under laboratory conditions.

2. Concern that the EPA is taking a litigation approach rather than a more 'educational/best management practice' approach

The EPA recognises that educational aspects are very important. This incorporates the provision of appropriate training, advice and information through to the development of best management practices and sustainable systems.

The licensing option and the legal implications of polluting waters have remained unchanged for 25 years, since the Clean Waters Act was introduced. Licences are not obligatory. Where a person, however, chooses to seek a licence, the EPA has a duty to determine the application.

Your decision to apply for a licence or not to apply for a licence is really a matter of risk assessment. If your activity is unlikely to pollute waters, you probably don't need to apply for a licence. If your activity is likely to significantly pollute waters, it can only be carried out legally if it is licensed by the EPA (in this case the EPA would need to consider that the gain from the activity outweighed any environmental harm).

3. Concern over cost of licences

An annual licence for herbicide spraying generally costs 2 fee units = \$146.60. The EPA also issues short-term licences for one-off programs, which cost a proportion of the annual fee depending on the number of months required (minimum \$73.30 to cover administration costs).

4. Need for up to date best management practice information

There is no doubt that people want, and would use, best management practice information. In the draft licensing guidelines, we refer to the 1985 national Guidelines on Herbicide Use In or Near Water (now 10 years old).

You will be pleased to know that a review of the 1985 Guidelines for Herbicide Use In or Near Waters has been recommended by the Water Resources Management Committee, a subcommittee of the Standing Committee on Agriculture and Resource Management.

Until this updated information becomes available, make good use of the information currently available to you. Information is available from training courses, NPAOs and other staff from NSW Agriculture, and relevant experts from other organisations. You collectively are also the source of considerable expertise, so discussions with other weed operators and managers facing similar problems are very valuable.

5. When do you need a licence *near* waters (rather than in waters)?

This is a question which was of interest to many respondents. This is something that really has to be evaluated on a case by case basis, as it will vary according to the type of vegetation adjacent to waters, the toxicity and persistence of individual chemicals, the amount of chemicals being used, the manner in which they are being applied etc - it is an assessment of the risk of polluting waters and causing environmental harm.

6. Does EPA have the expertise and authority to make a decision on whether herbicide application is the most appropriate option?

The EPA does have expertise in this area, and this will be enhanced by the transfer of officers from NSW Agriculture to administer the Pesticides Act. The EPA does not make these decisions without seeking advice, when appropriate, from a wide variety of sources.

7. Need greater use of non-chemical methods and better consideration of alternatives to herbicide use

There is considerable impetus for herbicide use - herbicides are often quick, effective, relatively cheap, and have been used for a long time. People don't necessarily like them, but they are seen to do the job. Alternatives to herbicide use are often dismissed as too

expensive, and in some cases the outcomes are seen as too uncertain. A contributing factor to the differential costing of weed control practices is that environmental resources are frequently undervalued in economic analyses.

I think that it is true to say that fully integrated weed management still has a long way to go, but it is certainly worth aiming for. An important contribution can be made by monitoring herbicide and other application techniques for their effectiveness and impacts.

8. What information do you need to provide with a licence application?

This was discussed above. Briefly reiterating, you need to provide information on where, what, how and why! The key to a successful application is the quality of the planning and management advice provided.

9. Who holds the licence? (Contractors, individual landholders, councils, other government authorities etc)

The person who applies for and is granted the licence is the licence holder. This usually is the person or agency which is seeking the protection of the licence.

10. Site specific versus regional licences

There is some scope for regional licences, applicable for example to a river or several rivers, providing site specific conditions are not required or can be determined at the time of application. A regional licence requires good planning on the part of the applicant - the EPA would need to have a copy of the regional program, and then the licensee would notify the nearest EPA regional office prior to working in a particular area.

11. Difficulties in specifying timing of weed control operations

While it may not be possible to specify actual dates of spraying, because of the possibility of unsuitable weather conditions and other unforeseen factors, it is certainly possible to specify a preferred time of spraying (e.g. the first week of September or the nearest suitable date), and then to notify the EPA one or more days before the event.

12. What sort of monitoring is required?

There is no single monitoring program which is appropriate for all herbicide applications. The monitoring program will vary according to the scale of the weed control program, the types of chemicals being used, the uses of the water (drinking water, stock water, irrigation water etc), the likely environmental impacts etc. Monitoring programs are determined by the relevant EPA region, with an appreciation of local conditions.

As a broad rule of thumb, the larger the program and the greater the potential impact, the more intensive the monitoring. Thus for example, small control operations involving spot spraying of weeds in a water course and at the water's edge may require a visual inspection of the treated areas (looking for any adverse impacts on aquatic biota other than the target species, and to determine the effectiveness of the spraying). This may need to be done at 2 or 3 time intervals (e.g. after 1 day, 1 week and 1 month), and perhaps consider impacts within 2 kilometres downstream of the treated sites. A major

program, such as spraying dense water hyacinth along 30 kilometres of river, may require more intensive monitoring e.g. in addition to the visual inspection, the EPA may require sampling of dissolved oxygen levels and some samples of water, sediments and/or biota for herbicide residues.

13. Delays in issuing the licence

Several submissions listed the time taken for the EPA to process licence applications as a significant concern.

You can contribute to the efficient issuing of licences by (i) having in place a well-planned and well-documented weed program, so that "non-emergency" control programs can be planned in advance, and so that information required by the EPA is readily obtainable and of an appropriate quality; (ii) providing the right information with the application (as discussed above, and this will be included in the revised guidelines); and (iii) maintain regular contact with the relevant EPA regional officer on the progress of the licence.

In a genuine "emergency" situation, the EPA can issue a licence quickly so that control programs can be implemented.

14. What constitutes appropriate training?

Farm Chemical User Training Program or equivalent (the EPA would seek advice from NSW Agriculture).

We are now finalising the guidelines in the light of comments received, and aim to release them shortly.

The control of weeds is a very important task, with significant benefits for production systems, amenity and the environment. It is in all of our interests to carry out this task in a manner which enhances productive land uses and amenity, while protecting the natural resources on which they are based. We need to work together to achieve the best outcomes - less weeds and a healthy environment!

--ooOoo--

How to Increase Effectiveness of Pesticides with Spray Adjuvants.



Nufarm
First choice
in
CROP PROTECTION

REVIEW OF THE NOXIOUS WEEDS ACT, 1993

Peter Gray
Noxious Plants Advisory Officer
NSW Agriculture, Dubbo

Two years have elapsed since the enactment of the Noxious Weeds Act 1993. This Act replaced the noxious plant control provisions of the Local Government Act 1919.

The 8th Biennial Noxious Weeds Conference was an opportune time to give councils an opportunity to comment on the Act and, in particular, any aspects which they believed needed amending. As with any new Act it is only after the legislation has been in operation for some time that it can really be evaluated.

Prior to the conference councils were invited to submit written submissions to form the basis for the session. Twenty two replies were received raising points of concern.

Two legal officers of NSW Agriculture Ms Sally Pearmain and Barbara Jones conducted the session and in addition to leading the discussion also advised many of the speakers on how to handle concerns they raised.

The points raised in the submissions and those raised during the discussion will be considered during the forth-coming review of the Act.

The major concerns raised were:

- The requirement to give notice before entering a property.
- The procedures for giving notice to enter.
- Appeal to the Land and Environment Court, particularly in regard to W1 noxious weed.
- The term 'land' should also indicate 'water'.
- 'Twenty four hours notice' should be 'at least twenty four hours notice'.
- 'Knowingly scatter' should be 'scatter'.
- Sale etc. of W2/W3 noxious weed material.

--ooOoo--

SPRAY DRIFT PROBLEMS?

Concerned about.....

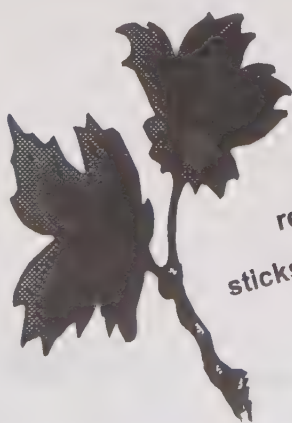
***Wastage of pesticides?
Risk of rain after spraying?***

Improve the accuracy of targeting your chemical with the vegetable oil carrier adjuvant...



Codacide® was developed in the UK in the late 1970's to provide a more efficient and effective targeting of pesticides and minimise wastage into the environment. Over ten years of trial work overseas together with trial work carried out in Australia demonstrates the usefulness in pre-mixing many plant protection products with the registered vegetable oil adjuvant *Codacide®* to reduce spray drift, improve

deposition and spreadability of the pesticide onto the target and reduce the volatility of pesticides as well as being an aid to providing rainfastness within minutes. Research shows that *Codacide®* can reduce drift prone droplets by 80% and also demonstrates why *Codacide®* is regarded as one of the most consistent products for rainfast protection.



will become rainfast in minutes
spreads much further than water
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ADJUVANTS - NEW DEVELOPMENTS - FUTURE TRENDS

A B McLennan
Agricultural Consultant
PO Box 240, Hornsby NS 2077
Phone 02 4777944 Fax 02 4777363

Adjuvant History

Crop production use of adjuvants dates back over 100 years when kerosene and soap was used as in insecticide.

Adjuvants were used in early '30s with organic herbicides. Their use grew slowly until the '50s when surfactants came into prominence as adjuvants, ie. Benefits gained when used with 2, 4-D. I remember using "Plus 50", "Swish" and "Raintain" in the 60's and being involved with "Foamspray", an antidrift material early in the 70's.

The development of adjuvants has continued both in general agriculture as well as I.W.C. work. Today their use is widely involved in agrichemical manufacture and also in agriculture - so much for history.

I suggest that each of you have used additives/adjuvants at some time in the past, ie:-

- ☐ Roundup® (Glyphosate) + Ammonium Sulphate (Liaise).
- ☐ Brush Off ® + nonionic wetter/surfactant.
- ☐ Kerosene, ad additive, to reduce foam in tanks.
- ☐ Probably P.S.O. and/or vegetable oils for drift control, rainfastness and other qualities.

Brief Technical Overviews

Adjuvant chemistry is not a topic we can cover in a short presentation and I don't intend to try to cover in depth, rather, I'll try and clarify some of the terminology used, ie. Wetting Agents, Surfactants, Penetrants, emulsifying, buffering agents.

The following definitions are approved by the Statuary body, A.A.V.C.C, which approves chemicals prior to use within a State.

Glossary

ADJUVANT	a substance added to farm chemical to improve its effectiveness or safety, eg. Penetrants, spreader-stickers, wetting agents and surfactant oils.
BUFFERS	adjuvants used to retard chemical degradation of some pesticides by lowering the pH of alkaline water.
DISPERSING AGENT	an adjuvant that facilitates mixing and suspension of a pesticide formulation in water.
DRIFT RETARDANT	an adjuvant added to a spray mixture to reduce drift.

EMULSIFYING AGENT/EMULSIFIER	a chemical which aids in the suspension of one liquid in another which normally would not mix together; forms an EMULSION ie. oil and water.
ENCAPSULATED PESTICIDE	a pesticide formulation with the active constituent enclosed in capsules of polyvinyl or other synthetic materials, ie. slow release chemical or fertiliser or the encapsulation of a pesticide via the use of a vegetable oil ie. Codacide.
FOAM RETARDANT	an adjuvant used to reduce the foaming of a spray mixture due to agitation.
PENETRANT	an adjuvant added to a spray mixture to enhance the absorption of a product.
SPREADER	an adjuvant used to enhance the spread of a chemical over a treated surface, thus improving the coverage.
STICKER	an adjuvant used to improve the adherence of spray droplets to a plant, animal, or other treated surface.
SURFACTANT	the word is derived from the phrase <u>SUR</u> face <u>ACT</u> ive ag <u>ENT</u> . An inert ingredient which improves the spreading, dispersing, and/or wetting properties of a farm chemical mixture.
WETTING AGENT	an adjuvant used to reduce the surface tension between a liquid and the contact surface for more thorough coverage.

Adjuvants can be described in general by what they are intended to do in a herbicide mix. The diagram below illustrates these groups.

ADJUVANTS

SPRAY MODIFIERS

- * Stickers
- * Film Formulas
- * Spreaders
- * Deposition Agents
- * Thickening Agents
- * Deposition Agents

ACTIVATORS

- * **Surfactants**
- * **Wetting Agents**
- * **Penetrants**
- * **P.S.O (PSO)**
- * **Vegetable Oil**
- This group is most important for foliar applied
- * Herbicides
- * Improve biological activity

UTILITY MODIFIERS

- * Emulsifiers
- * Anti Foam
- * Buffers
- * Compatibility Agents
- * Anti Foam Agent used with herb & fertiliser

In general, your work involves post emergence, folia, applied herbicides and therefore, the important group is ACTIVATOR ADJUVANTS. This group can also help with residual applications.

A point of interest is that while SURFACTANTS make up a very large class of adjuvants.

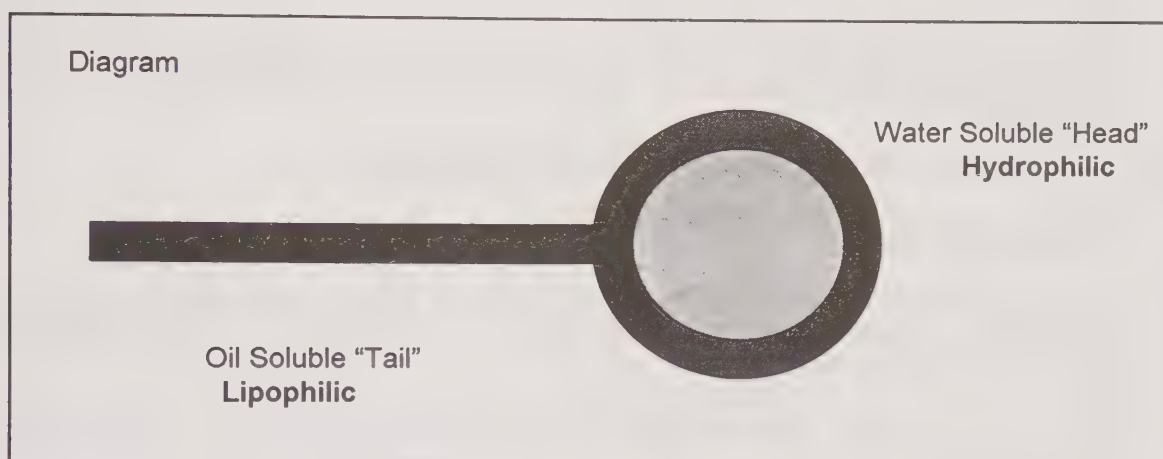
NOT ALL ADJUVANTS ARE SURFACTANTS

Surfactants

Surfactant Molecules

Regardless of their chemical properties, surfactants have a common feature, they comprise two (2) segments.

- ☐ A strong polar group which is attracted to water (referred to as HYDROPHILIC)
- ☐ A non-polar group attached to oil materials (referred to as LIPOPHILIC)



Depending on the IONIC (static electrical) charge of the water head determines the surfactant classification.

- | | | | |
|--------------------------|-----------|---|----------|
| ☐ | ANIONIC | - | Negative |
| ☐ | CATIONIC | - | Positive |
| ☐ | NON-IONIC | - | Neutral |

The length of the "tail" on the other hand determines the oil attachability.

The "heads" affinity for water determines the surfactants emulsifying qualities.

Herbicides, I believe, are still your major tool.

It is a recognised fact that between 1-3% of chemicals applied in a water carrier are biologically effective, ie. Kill Weeds (Graham; Bryce; Caseley; Himel, et al)

The high chemical (Herbicide) wastage arises from using water as the spray carrier. Losses result from:

- ☐ Evaporation
- ☐ Droplet Drift
- ☐ Poor uptake and failure to stick to target
- ☐ Run off

I believe this is wasteful, uneconomical and harmful to the environment.

Can adjuvants improve Herbicide effectiveness and their performance?

The answer is YES, however, there must be a marriage between the product (Herbicide) and adjuvant used.

Research in the last decade has led to a rapid increase in the use of ADJUVANTS that improve the performance of sprays in a water carrier, ie. wetters, spreaders, stickers, penetrants, etc.

I wish to elaborate today, about Codacide®, a vegetable, spray oil.

Codacide History

Briefly, it was developed in the UK in 1983 when Mr Barnett, working on Control Droplet Application (CDA) equipment, used vegetable oils to obtain uniform droplets, minimise drift and obtain chemical plant adhesion.

Incidentally, the name "Codacide" was derived from the C of D.A. (cide), hence the name.

What is Codacile Oil?

Codacide is 95% NATURAL CANOLA (food grade) oil with 5% of special compound EMULSIFIERS which are the key to its consistent performance. When premixed with the chemical(s), the emulsifiers latch onto the chemical molecules ENCAPSULATING them in a coating of oil. It is this encapsulation that is the key to Codacide's efficiency as a CARRIER of chemicals.

Results of Encapsulation are:-

- ☐ Reduction in number of small droplets
 - uniformity of droplet size
 - control drift
 - increased plant contact under wind, temperature, low humidity
- ☐ Is non phytotoxic and biodegradable
- ☐ Increased adherence - (Sticker)
- ☐ Spreadability - 8-16 times more than water
- ☐ Less evaporation - (longer chemical contact)
- ☐ Rainfastness

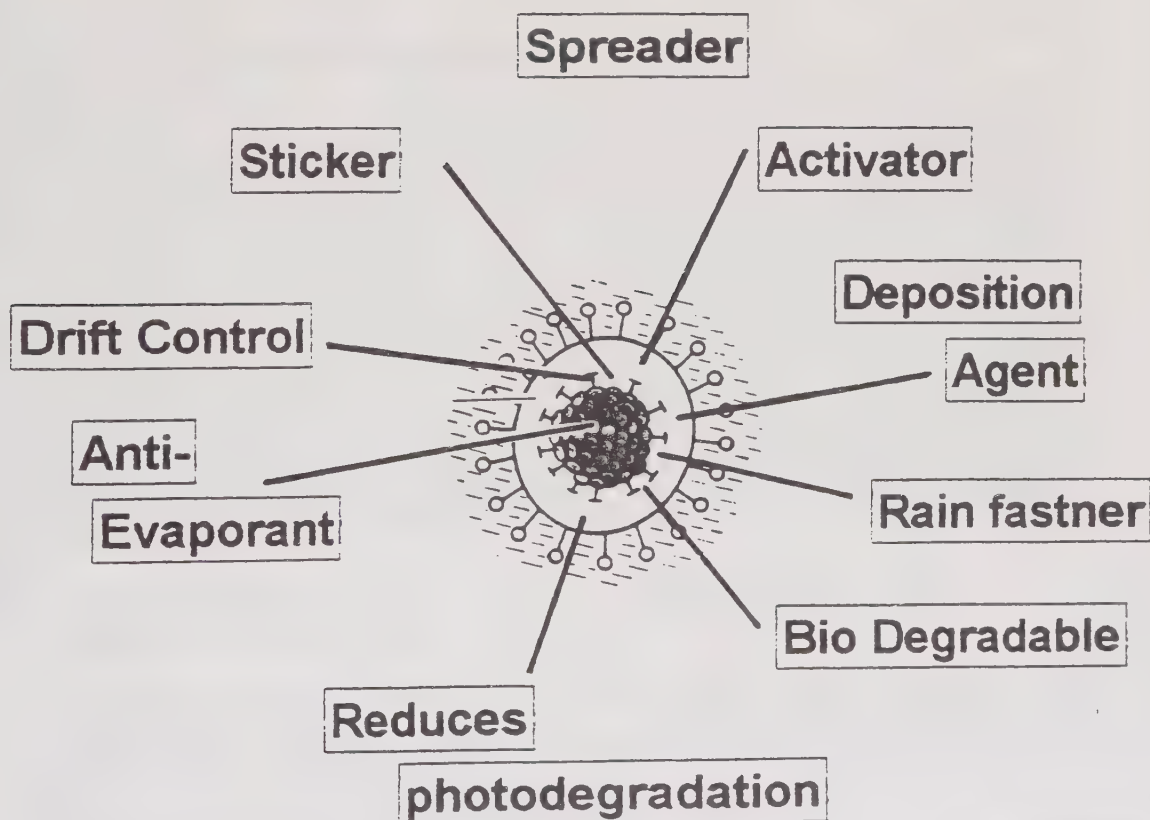
- ☐ Increased uptake - Triglycerides oils of plants are the same as in Canola oil. (There is a mutual affinity between the two).
- ☐ UV protection - reduces photodecomposition
- ☐ Shields the chemical from volatility loss

Codacide is fully biodegradable into CO² and H₂O (Carbon Dioxide and Water). It does not change the active ingredient (pesticide) in any way, nor impede the normal degradation of the pesticide.

Codacide, therefore, is a multi purpose adjuvant.

CODACIDE®

Multi-purpose Vegetable Oil Adjuvant Carrier



FUTURE TRENDS

- ☐ Continuing pressure, world wide, to reduce pesticide use in agriculture, horticulture and Linear Reserve Management areas.
- ☐ Council/Shire/Community concerns will influence need for environmentally friendly products:
 - Biological products
 - Native competitive species
 - Alternate Management Practices (IPM)
- ☐ Continuing research on how current/future adjuvants will influence droplet deposition, retention and drift control will benefit application technology.
- ☐ Adjuvants for Agrochemical - why we need to know precisely how they work - mode of action, enhancement of biological activity.
- ☐ Pesticide spray carriers of the future may not be water.

Wars will be fought over water,

World Bank warns

Aust. 8/8/95

- ☐ Genetic engineering may change current noxious plants to useful ones. (Ref: Recent Research; St John Wort can provide a useful natural medicine oil from the harvested flowers).

--ooOoo--

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***REMOTE CONTROL
RETRACTABLE
HOSE REELS***



Remote Control *RETRACTABLE* Hose Reels

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Why invest in a QUIK SPRAY remote control retractable hose reel system?

Quik Spray is AUSTRALIAN INVENTED, AUSTRALIAN MADE, AND AUSTRALIAN OWNED.

A QUIK SPRAY system will offer you...

- HUGE TIME SAVINGS:** Sprayers boast an increase of double, and more, in the area sprayed per day. This represents a **doubling of productivity !**
- ONE PERSON OPERATION:** Because the sprayer has complete control of the hose with the touch of a button on the belt, the need for a second person to wind up or manage the hose is eliminated thus **doubling efficiency !**
- REDUCES FATIGUE:** Since the hose rewind is strong enough to assist the operator up, even steep hills, and there is no longer a need to wind up hoses manually, the operator experiences far less physical exertion. This benefit integrates with the philosophy outlined in all **Workplace Health and Safety recommendations.**
- REDUCES FRUSTRATION:** As the sprayer is always at the end of the spray hose it cannot become caught on sticks, rocks, or become entangled. Not only does this greatly **improve efficiency** but it also contributes to **positive staff moral.**

The organisations below use, and are extremely pleased with, their Quik Spray investment.

*State Forests of New South Wales
National Parks and Wildlife Service
Dept. of Conservation and Environment (Vic.)
Dept. of Conservation and Land Management (W.A.)
Dept of Environment and Heritage (Qld.)
Dept. of Primary Industries and Fisheries (N.T.)
A.C.T. Parks and Conservation Service
Noxious Plants County Councils - throughout N.S.W.
Rail, Road, and Water management authorities across Australia
Local Shire Councils - throughout Qld., N.S.W.
Noxious Plants spraying contractors - throughout Australia and New Zealand*

Remember: The BENEFITS you gain by investing in the Quik Spray system means it pays for itself in a short period of time!

(No other spray system in the world can boast this !)

DRY PRODUCT TECHNOLOGY & ENVIRODRUMS

Bill Hannaford
Research & Development Officer
P O Box 129
SOUTH WAGGA NSW 2650
Phone: 069 21 5430 Fax: 069 21 5242

The Problem with Pesticides

Most people these days have concerns when using pesticides. How toxic is the chemical to me and how toxic will it be the environment?

Another major concern people have is disposing of pesticide drums. The government is now trying to reduce the numbers of empty drums on farms and at depots and Nufarm, as one of Australia's largest pesticide manufacturers and distributors is investing considerable time and effort into tackling this problem.

Dry Products

Already Nufarm has a large range of dry products on the market as powders in water soluble bags and granules. One of the major advantages with dry products is that if the pesticide is split there is a much reduced danger of soil contamination. The other major advantage is the one of container disposal as dry formulations are packed in cardboard boxes and these have obvious disposal advantages over plastic or metal drums.

Baton

Nufarm has recently released Baton, which is 2,4-D Amine as a wettable powder in pre measured water soluble bags. Baton is the same form of 2,4-D as Nufarm's Amicide 500 - the Dimethylamine sale - and it also has the same low volatility. However it is over one and a half times as strong with 800g/kg of active 2,4-D. This means to achieve similar areas of weed control, you use less volume of product, you have half the weight to handle and you don't have the drum disposal problems.

In the past people have had problems getting wettable powders from the packet into the tank and out through the nozzles. However with Baton, because of the water soluble bags, there are no dust problems, no spillage problems and if you follow the simple mixing procedure there are no mixing or blockage problems. Nufarm recommends partly fill the tank to about 20%, add the water soluble bags, allow bags to soak for at least 3 minutes while adding water to half fill mark, commence agitation then complete filling with water.

Deep Filter Baskets and Venturi Systems

To increase the mixing of dry products Nufarm is promoting the use of Deep Filter Baskets and Venturi Systems. Some people have been discouraged when using dry products because they have caused filter and spray unit blockages. Deep Filter Baskets sit inside the tank and aid the mixing of water soluble bags by keeping them in the middle of the tank not at the bottom near the outlet. Venturi Systems have been designed to increase

the water flow at a point where the dry products such as granules and water are mixed together. This increase in water flow causes the granules to dissolve much more than standard agitation.

Nufarm Envirodrum

Nufarm's commitment to safer handling and transport of herbicides, and reduction of unwanted containers in the environment, is gaining pleasing support from agricultural chemical users right across Australia with the release Nufarm's Envirodrum. The Envirodrum is fully sealed, one hundred and ten litre returnable bulk container and offers an alternative to the standard 20 or 200 litre non returnable drums. The Envirodrum has the advantage of reducing operator exposure as there is no pouring or rinsing of chemical containers if the Envirodrum is connected via the pump and a hose to the spray tank. Products that are available in this environmentally friendly bulk container include Amicide 500, Glyphosate 360, Glyphosate CT, Nugrass and Trifluralin with Estercide 800 being made available in the near future.

--ooOoo--

**ANNOUNCEMENT
NOXIOUS PLANTS OFFICERS ASSOCIATION OF N.S.W.**

ELECTION OF OFFICERS SEPTEMBER 1995

Association office bearers, Committee and life members:-

President	Kim Bellairs
Secretary	Rob Waller
Treasurer	Eddie Lanting
Vice President	Dave Richards
Assistant Secretary	Val Stubbs
Assistant Treasurer	Terry Eyles
Publicity Officer	Terry Schmitzer

COMMITTEE (Regional Delegates)

Region 1	Bruce Scott
Region 2	Jim Cherry
Region 3	John Chapman
Region 4	Ian Borrowdale
Region 5	Dick Honeyman

LIFE MEMBERS

1993	Don Armstrong
1993	Ron Nalder
1995	Wal Samuels
1995	John Attley
1995	Jack Fahey
1995	Bob Leech
1995	Brian Abra

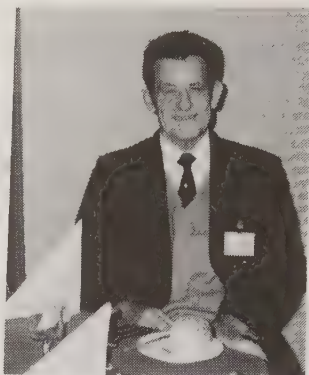
Congratulations to all concerned!

8th Biennial Noxious Weeds Conference - Goulburn NSW, 1995

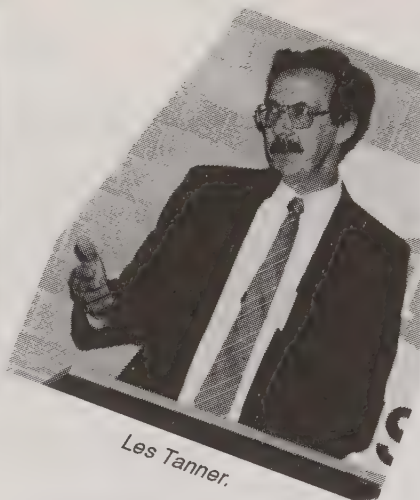
The following pages are something of a "rogues' gallery" from the night of the official Conference Dinner - Thursday, 21 September 1995:



Dick Honeyman - gathering material for a new poem.



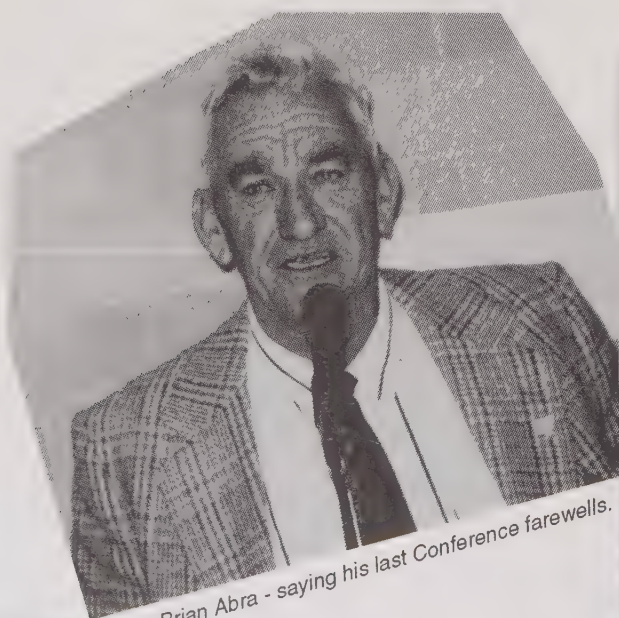
Dick Honeyman - ready to go!



Les Tanner.



Peter Gorham, Chris Evans, and Kim Bellairs being entertained by John Abbott.



Brian Abra - saying his last Conference farewells.



Dick Honeyman, Jock Colwell - observing the action.



Debbie Orton from the Academy looking after Dave Richards and Graham Mathews.



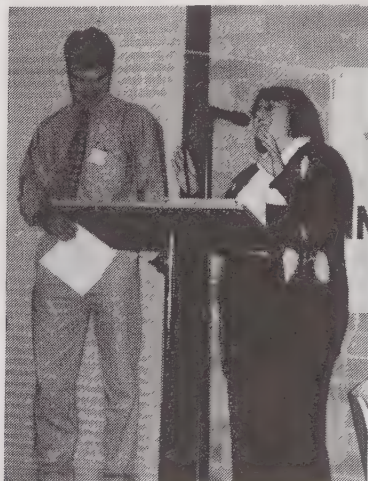
Robbie Cheetham and Jock Colwell.



Waiting to go back into school.



Chris Evans



Bill Hannaford presenting Melinda Sargeant with her Nufarm prize for winning the weed identification contest.

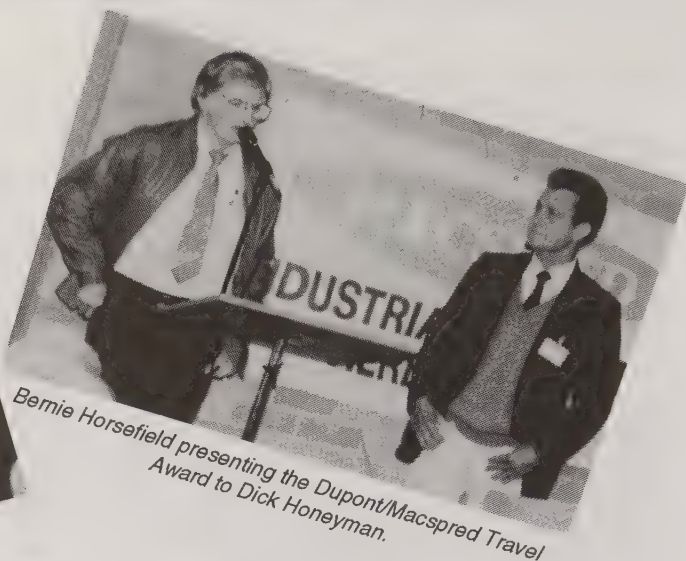


Ian Borrowdale receiving his Weed Society Prize from David Theriault.

8th Biennial Noxious Weeds Conference - Goulburn NSW, 1995



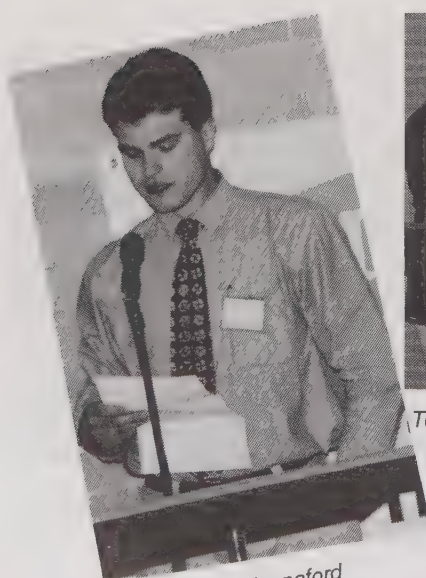
Good fellowship...



Bernie Horsefield presenting the Dupont/Macsprad Travel Award to Dick Honeyman.



School's in at the 8th Biennial Noxious Weeds Conference.



Bill Hannaford



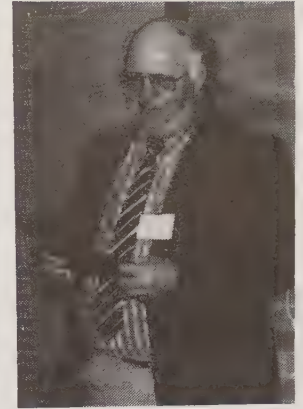
Terry Eyles receiving the Innovative Ideas Award from John Abbott.



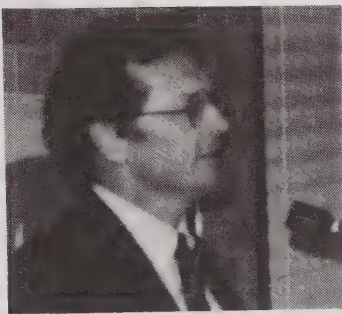
Chairman for the night - Bob Trounce.



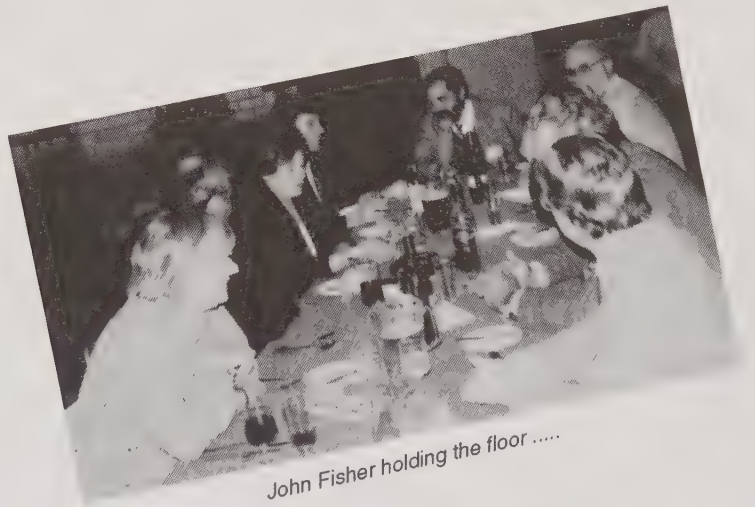
*Geoff Keech -
announcing the Dupont/Macspreed travel Award winner.*



*Rob Waller - receiving his
new watch so he won't miss
the bus at the next
Conference!*



David Theriault



John Fisher holding the floor



*Peter Gray presenting Ron Roberts with his
"Achievement Award"*



John Toth - looks like he found the slivovitz!

ALLIGATOR WEED

IT CHOKES RIVERS
AND IRRIGATION
SYSTEMS AND
IS EXTREMELY
DIFFICULT TO
CONTROL



PHOTO ANDREW STORRIE

"CAN YOU IDENTIFY IT?"

If you see any plant that looks like this contact
NSW Agriculture or your Local Council
IMMEDIATELY

**PARTHENIUM WEED
ALLIGATOR WEED**
INFORMATION BROCHURES
available from
NSW Agriculture
Inquiries to Bob Trounce
NSW Agriculture
LB 21, Orange 2800
Phone 063 913156 Fax 063 913605

Parthenium



Weed

**Noxious
Weed**

spreads rapidly

affects human
and animal
health

is difficult
and expensive
to control

affects
agricultural
productivity

reduces
land values



NSW Agriculture

NEW SOUTH WALES

Parthenium Weed Exclusion Zone

**KEEP OUR STATE
PARTHENIUM FREE**

This noxious weed

- Spreads rapidly
- Affects human and animal health
- Is difficult and expensive to control
- Affects agricultural productivity
- Reduces land values

Warning

A single plant can produce 15,000 seeds!

Do not handle suspect plants. Report any findings to authorities immediately.

For further information, contact your Council Weeds Inspector on () or NSW Agriculture.



NSW Agriculture



rosette



flower

Mr ABBOTT	John	DuPont (Aust.) Ltd	Advisor	18 Perry Ave	SPRINGWOOD	2777	(047) 511 135	(047) 515 748
Mr ABER	David	Shoalhaven City Council	Mgr Support Services	PO Box 42	NOWRA	2541	(044) 293 111	
Mr ABRA	Brian	Moree Plains Shire Council	Chief Weeds Officer	PO Box 420	MOREE	2400	(067) 529 533	(067) 522 425
Mr ACKARY	David	Upper Macquarie County Council	Nox Weeds Insp	PO Box 703	BATHURST	2795	(063) 314 200	(063) 312 121
Mr ADAMS	Kevin	Murrumbidgee Shire Council	Noxious Plants Inspector	PO Box 5	DARLINGTON POINT	2706	(069) 684 166	(069) 684 252
Ms ADAMSON	Lee	ACT Agriculture	Ranger	PO Box 1038	TUGGERANONG	2901	(06) 207 2276	(06) 207 2268
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Mr ANDERSON	Rodney	Urana Shire Council	Nox Plants Inspector	PO Box 55	URANA	2645	(069) 208 205	(069) 208 060
Mr ASHTON	Dennis	Sydney Water	Catchment Prot. Officer	PO Box 365	GUILDFORD	2161	(02) 795 4490	(02) 795 4322
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Mr BALDWIN	Don	Upper Macquarie County Council	Chief Weeds Officer	PO Box 703	BATHURST	2795	(063) 314 200	(063) 312 121
Mr BANFFEY	Chris	Natl Parks & Wildlife Service	Pest Species Officer	PO Box 330	OBERON	2787	(063) 361 972	
Mr BARLOW	Peter	Mulwaree Shire Council	Weeds Officer	PO Box 148	GOULBURN	2580	(048) 211 933	(048) 219 668
Mr BATE	Tony	Illawarra Dist (Nox.) Weeds Auth.	Plant Operator/Inspector	PO Box 148	KIAMA	2533	(042) 331 129	
Mr BATTENALLY	Steve	Wakool Shire Council	Noxious Weeds Inspector	PO Box 40	MOULAMEIN	2733	(058) 875 007	(058) 875 103
Mrs BELLAIRS	Kim	Far North Coast County Council	Inspector	PO Box 168	KYOGLÉ	2474	(066) 335 178	
Mr BISHOP	Tim	DuPont (Aust) Ltd	Product Manager	PO Box 930	NORTH SYDNEY	2059	(02) 992 36111	(02) 992 36132
Mr BLACKMORE	Phil	NSW Agriculture	Act. Nox. Plants Adv. Offcr	PO Box 991	ARMIDALE	2350	(067) 737 288	(067) 728 664
Mr BORROWDALE	Ian	Shoalhaven City Council	CWO	PO Box 42	NOWRA	2541	(044) 293 111	(044) 236 373
Mr BOULTON	Mike	Nox. Weeds Adv Comm.	Member (DWR)	PO Box 717	DUBBO	2830	(068) 842 560	(068) 840 096
Mr BOURKE	Barry	Newcastle City Council	Pest & Weed Control	PO Box 489	NEWCASTLE	2300	(049) 299 356	(049) 293 728
Mr BOWLES	Alan	Nymboida Shire Council	Noxious Weeds Officer	PO Box 51	SOUTH GRAFTON	2461	(066) 421 866	(066) 431 817
Mr BOWLING	Scott	Ulmarra Shire Council	Weeds Inspector	PO Box 13	ULMARRA	2462	(066) 445 303	(066) 445 366
Mr BRACKEN	John	Newcastle City Council	Supervisor	PO Box 489	NEWCASTLE	2300	(049) 299 356	(049) 293 728
Mr BROOKS	Michael	Narrabri Shire Council	Weeds Officer	PO Box 261	NARRABRI	2390	(067) 921 699	
Mr BROWN	Paul	Mulwaree Shire Council	Weeds Officer	PO Box 148	GOULBURN	2580	(048) 211 933	(048) 219 668
Mr BULLEY	Brian	Narramine Shire Council	Noxious Weeds Inspector	PO Box 115	NARROMINE	2821	(068) 891 322	(068) 892 579
Mr BUNN	Ken	Port Stephens Council	Weeds & Pest Control Officer	PO Box 42	RAYMOND TERRACE	2324	(049) 831 333	(049) 863 612
Mr BURFORD	Brian	Griffith City Council	Chief Weeds Officer	PO Box 485	GRIFFITH	2680	(069) 621 277	(069) 627 161
Mr BURTON	Kevin	Wollondilly Shire Council	Nox Weeds Officer	PO Box 21	PICTON	2571	(046) 771 326	(046) 772 339
Mr BUSHBY	Alan	Upp Hunter C. C. Weeds Auth.	Gen Mgr/Chief Weeds Officer	PO Box 122	MUSWELLBROOK	2333	(065) 432 866	(065) 433 790
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Ms CALDICOT	Jane	Nox. Weeds Adv. Comm.	TCM	PO Box 108	WAUCHOPE	2446	(065) 853 722	(065) 852 242
Ms CARDER	Jane	ACT City Parks	SOC	PO Box 1119	TUGGERANONG	2901	(06) 207 2525	(06) 207 2502
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Mr CHAPMAN	Ian	Mid Western County Council	Chief Weeds Officer	PO Box 138	MUDGEE	2850	(063) 721 300	(063) 726 348
Mr CHEETHAM	Robbie	Central Murray County Council	General Manager	1 Druiett Court	FINLEY	2713	(058) 812 139	(058) 812 139
Mr CHERRY	Jim	Central Northam County Council	Noxious Weed Control Mgr	PO Box 155	QUIRINDI	2343	(067) 461 755	(067) 663 038
Mr CHRISTIAN	Phillip	NSW Agriculture	Supervisor	RMB 944	TAMWORTH	2340	(067) 631 175	(067) 631 222
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Mr CLARK	Alan	Narrandera Shire Council	Nox Weeds Inspector	PO Box 39	NARRANDERA	2700	(069) 592 277	(069) 591 884

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Ms COLGAN	Kathy	Aust Nature Conservn Agcy	Asst Dir Invasive Sp Pgm	PO Box 636	BELCONNEN	2601	(06) 250 0273	(06) 250 0314
Cr COLLINS	Tim	Bega-Valley Shire Council	Mayor	PO Box 492	BEGA	2550	(064) 929 400	(064) 923 323
Cr COLLINSON	Geoff	Yarrowlumla Council	Councillor	PO Box 112	QUEANBEYAN	2620	(06) 238 2278	
Mr COLWILL	Jock	Coolamon Shire Council	Noxious Weeds Officer	PO Box 101	COOLAMON	2701	(069) 273 206	(069) 273 168
Mr CONE	Tim	UHCC Weeds Authority	Dist Weeds Officer	PO Box 122	MUSWELLBROOK	2333	(065) 432 866	(065) 433 790
Mr CONLAN	John	Lockhart Shire Council	Noxious Weeds Inspector	PO Box 21	LOCKHART	2656	(069) 205 305	(069) 205 247
Mr COOK	Tony	NSW Agriculture	Tech Offcr (Weeds)	RMB 944	TAMWORTH	2340	(067) 631 100	(067) 631 222
Mr CORCORAN	Jason	Sthn Slopes Nox Plants Auth	Nox Plants Inspector	PO Box 3	BOOROWA	2586	(063) 853 189	(063) 853 562
Mrs COREY	Sharon	CSIRO Entomology	Scientific Liaison Officer	GPO Box 1700	CANBERRA	2601	(06) 246 4136	(06) 246 4177
Cr CRAMERI	Ken	Penrith City Council	Councillor	PO Box 60	PENRITH	2751	(047) 327 633	(047) 327 628
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Mr CUMMINS	Joe	Dept Land & Water Conservation	CoOrdinator Reserves Man	PO Box 53	ORANGE	2800	(063) 638 293	(063) 623 896
Mr DAVIES	Rob	Temora Shire	Weed Inspector	16 View St	TEMORA	2666	(069) 771 099	(069) 772 996
Mr DAWSON	Peter	Central Northam County Council	Weeds Officer	PO Box 155	QUIRINDI	2343	(067) 461 755	(067) 663 038
Mr DEANE	Peter	Tallaganda Shire	Chief Weeds Officer	PO Box 91	BRAIDWOOD	2622	(048) 422 225	(048) 422 669
Mr DEATH	Tom	Cowra Shire Council	Noxious Plants Inspector	PO Box 342	COWRA	2794	(063) 410 148	(063) 411 031
Mr DELLOW	Jim	NSW Agriculture	Agronomist (Weeds)	AR & VC	ORANGE	2800	(063) 913 800	(063) 913 883
Mr DODGSON	Allan	Lachlan Shire Council	Noxious Weeds Inspector	PO Box 216	CONDOBOLIN	2877	(068) 952 377	(068) 953 478
Mr DODKIN	Mike	Natl Parks & Wildlife Service	Pest Species Officer	PO Box 61	PORT MACQUARIE	2444	(065) 842 203	
Mr DONKIN	Paul	Workcover Authority of NSW	Dept. Professional Officer	5A Pioneer Av	THORNLEIGH	2120	(02) 484 6655	(02) 980 6849
Mr DONOHOE	Robert	Grafton City Council	Noxious Plants Officer	PO Box 24	GRAFTON	2460	(066) 422 266	(066) 427 647
Mrs DONOHOE	Susan	Grafton City Council	Noxious Plants Officer	PO Box 24	GRAFTON	2460	(066) 422 266	(066) 427 647
Mr DRURY	Dean	Greater Taree City Council	Noxious Weed Officer	PO Box 482	TAREE	2430	(065) 913 108	(065) 913 311
Mr DWYER	Brian	Upper Macquarie County Council	Assistant General Manager	PO Box 703	BATHURST	2795	(063) 314 200	(063) 312 121
Mrs EDMONDS	Maria	Port Stephens Council	Snr Weeds/Pests Cont Offcr	PO Box 42	RAYMOND TERRACE	2324	(049) 831 333	(049) 872 612
Mr ELLISON	Peter	Tumut Shire Council	Nox Weeds Inspector	PO Box 123	TUMUT	2720	(069) 471 022	(069) 473 999
Mr ELMER	Frank	State Rail Authority	Herbicide Opt'r	126 Church St	PARRAMATTA	2150	(02) 843 9043	
Mr ENGLAND	Ken	Natl Parks & Wildlife Service	Technical Officer	PO Box 351	MUSWELLBROOK	2333	(065) 433 533	(065) 411 085
Mr ENNIS	John	Nambucca Shire Council	Noxious Weeds Inspector	PO Box 177	MACKSVILLE	2447	(065) 682 555	(065) 682 201
Mr ENSBEY	Rod	NSW Agriculture	Supervisor	PO Box 285	GRAFTON	2460	(066) 420 448	(066) 427 251
Mr EVANS	Chris	Monsanto Aust Ltd	Sales Specialist	PO Box 278	HARBORD	2096	(02) 939 6079	
Mr EYLES	Terry	Wyong Shire Council	Noxious Weeds Officer	PO Box 20	WYONG	2259	(043) 531 333	(043) 512 098
Mr FALLOW	Keith	Monsanto Aust Ltd	Prod. Dev. Officer	PO Box 156	BENDIGO	3555	(054) 437 415	
Cr FANNING	Ron	Cabonne Shire Council	Councillor	PO Box 17	MOLONG	2866	(063) 668 303	(063) 668 799
Mr FERRIS	Greg	State Rail Authority	A/Agronomist	126 Church St	PARRAMATTA	2150	(02) 843 9043	
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Mr FERRY	Eddie	Fairfield City Council	Weeds Officer	PO Box 21	FAIRFIELD	2165	(02) 725 0394	(02) 609 3257
Mr FIELD	Bob	Goulburn City Council	Noxious Weeds Inspector	PO Box 725	GOULBURN	2580	(048) 230 409	(048) 222 081
Mr FISACARO	Joe	Central Murray County Council	Noxious Plants Inspector	PO Box 909	DENILIKUIN	2710	(058) 812 139	(058) 812 139

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Mr FISHPOOL	Ken	NSW Agriculture	Assist. to Chief	Locked Bag 21	ORANGE	2800	(063) 913 318	(063) 913 206
Mr FITZGERALD	John	New England Tblnds C.C.	District Weeds Officer	PO Box 881	ARMIDALE	2350	(067) 711 700	(067) 711 893
Mr FRANCIS	Ron	Blue Mountains City Council	Noxious Weeds Officer	PO Box 189	KATOOMBA	2780	(047) 820 539	(047) 820 589
Cr FRASER	Bob	Jerilderie Shire Council	Councillor	PO Box 96	JERILDERIE	2716	(058) 861 200	(058) 861 701
Mr GAMBLE	Jeff	MIA Rural Services	Wholesale Manager	PO Box 1594	GRIFFITH	2680	(069) 642 999	(069) 627 851
Mr GARDINER	Mark	Wagga Wagga City Council	Chief Noxious Weeds Officer	PO Box 20	WAGGA WAGGA	2650	(069) 235 257	(069) 235 396
Mr GEYER	Robert	Workcover Authority of NSW	Lab. Services Unit Coord	5A Pioneer Av	THORNLEIGH	2120	(02) 484 6655	(02) 980 6849
Mr GILES	Peter	Bogan Shire Council	Weeds Inspector	PO Box 221	NYNGAN	2825	(068) 321 503	(068) 321 965
Mr GORDON	John	New England Tblnds C.C.	District Weeds Officer	PO Box 881	ARMIDALE	2350	(067) 711 700	(067) 711 893
Mr GORHAM	Peter	NSW Agriculture	Nox. Plants Adv. Offcr	PO Box 129	COWRA	2794	(063) 42 2122	(063) 411 816
Mr GORRINGE	David	Upper Macquarie County Council	General Manager	PO Box 703	BATHURST	2795	(063) 314 200	(063) 312 121
Mr GOULSTON	Richard	Ku-Ring-Gai Municipal Council	Regulatory Officer	PO Box 15	GORDON	2072	(02) 498 0888	(02) 498 0880
Mr GRACE	Barry	Cootamundra Shire Council	Noxious Weeds Inspector	PO Box 420	COOTAMUNDRA	2590	(069) 422 744	(069) 423 690
Mr GRAY	Andrew	Central Murray County Council	Noxious Plants Inspector	87 Russell St	DENILIQUIN	2710	(058) 812 139	(058) 812 139
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Mr GREEN	Robert	State Rail Authority	Technical Services Manager	PO Box 1272	WOLLONGONG	2500	(042) 235 592	(042) 269 963
Mr GRIMM	Anthony	Cooma-Monaro Shire	Weeds Officer	PO Box 714	COOMA	2630	(064) 501 777	(064) 501 799
Mr GUNTHER	Jim	State Rail Authority	Tech Officer - Veg	PO Box 1017	DUBBO	2830	(068) 812 169	(068) 812 168
Mr HANNAFORD	Bill	Nufarm Ltd	Res & Devel	PO Box 129	STH WAGGA WAGGA	2650	(069) 215 430	(069) 215 242
Mr HANSEN	Phil	Queanbeyan City Council	Noxious Weeds Inspector	PO Box 90	QUEANBEYAN	2621	(015) 488 726	(06) 298 0296
Mr HARDING	Graham	Eurobodalla Council	Snr Nox. Weeds Inspector	PO Box 99	MORUYA	2537	(044) 741 269	(044) 741 234
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Mr HIBBERSON	Neil	Holbrook Shire Council	Weeds Officer	PO Box 99	HOLBROOK	2644	(060) 362 155	(060) 362 683
Mr HILLIER	Dennis	Gunning Shire Council	Chief Weeds Officer	PO Box 42	GUNNING	2581	(048) 45 1312	(048) 451 426
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Mrs HORSFIELD	Shirley	Macspred Pty Ltd		PO Box 6887	WETHERILL PARK	2164	(02) 756 4433	(02) 756 4435
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Mr HOWARD	Dennis	Nyngan Rural Lands Prot. Board	Reserves Foreman	PO Box 45	NYNGAN	2825	(068) 321 008	(068) 321 635
Cr HOWARTH	John	Upper Macquarie County Council	County Chairman	PO Box 703	BATHURST	2795	(063) 314 200	(063) 312 121
Mr HOWE	Terry	Sthn Slopes Nox Plants Auth	Nox Plants Inspector	PO Box 3	BOOROWA	2586	(063) 853 189	(063) 853 562
Mr HOWSE	Ned	J O'Malley & Co	Ind Sales Manager	45 Prime Dr	SEVEN HILLS	2147	(02) 838 9188	(02) 674 2078

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Mr	IRONS	Jim	Narrabri Rural Lands Prot. Board	Ranger	PO Box 18	NARRABRI	2390	(067) 922 533	(067) 921 738
Mr	JACKSON	Peter	Natl Parks & Wildlife Service	Pest Species Officer	PO Box 39	COONABARABRAN	2357	(068) 421 311	(068) 422 124
Mr	JOHNSON	Ian	Cobbett P/L	Sales Manager	PO Box 240	HORNSBY	2077	(02) 477 7944	(02) 477 7363
Mr	JOHNSTON	Lionel	Pacific Power	Land Management Officer	Wang Pwr Stn	WALLERAWANG	2845	(063) 528 641	(063) 528 740
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Mr	KANE	Mike	NSW Agriculture	Inspector	PO Box 209	MOREE	2400	(067) 525 111	(067) 524 859
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Mr	KAYE	David	Sydney Water	Weeds Officer	C/- Bargo PO	BARGO	2574	(046) 841 209	(046) 841 963
Mr	KEECH	Geoff	Macspred Pty Ltd	Sales Supervisor	PO Box 6887	WETHERILL PARK	2164	(02) 756 4433	(02) 756 4435
Mr	KELLY	Ian	Castlereagh Macq C Council	Chairman	PO Box 31	WALGETT	2832	(068) 281 399	(048) 692 040
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Mr	KNELLER	Stephen	North West Weeds	Noxious Plants Inspector	PO Box 93	WARIALDA	2402	(067) 291 016	(049) 293 728
Mr	LANE	Allan	Newcastle City Council	Pest & Weed Control	PO Box 489	NEWCASTLE	2300	(049) 299 356	(02) 364 7339
Mr	LANGRIDGE	Alisdair	NSW Agriculture	Media Officer	PO Box 657	MASCOT	2020	(02) 364 7325	(043) 676 277
Mr	LANTING	Eddie	Gosford City Council	Weeds Officer	PO Box 21	GOSFORD	2260	(043) 258 432	(063) 668 303
Cr	LAWRENCE	Don	Cabonne Council	Councillor	PO Box 17	MOLONG	2866	(068) 522 831	(065) 628 902
Mr	LE BROCCQUE	Steven	Comm Rehab Open Trng Ntwk	Student	8 Grenfell St	FORBES	2871	(065) 626 077	(048) 322 066
Mr	LEDDY	Paul	Kempsey Shire Council	Noxious Weeds Inspector	PO Box 78	WEST KEMPSEY	2440	(048) 321 022	(02) 585 6401
Mr	LEECH	Bob	Crookwell Shire Council	Landcare Officer	PO Box 10	CROOKWELL	2583	(02) 585 6651	(069) 441 475
Dr	LEYS	Andrew	Natl Parks & Wildlife Service	State Coordinator Pest Man	PO Box 1967	HURSTVILLE	2220	(069) 441 266	(050) 201 620
Mr	LINDLEY	Gordon	Gundagai Shire Council	Mayor	Sheridan St	GUNDAGAI	2722	(02) 224 3106	(049) 434 275
Mr	LODGE	Alan	Bairnald Council	Weeds Officer	PO Box 120	BALRANALD	2715	(02) 438 233	(063) 726 870
Mr	LONGWORTH	Jim	Nox. Weeds Adv. Comm.	SRA	2 The Bvd	CHELLENHAM	2119	(066) 622 396	(02) 498 0880
Mrs	LOUGHRAN	Ann	Hunter Inst of Tech (TAFE)	Teacher of Horticulture	Tiral Street	CHARLESTOWN	2290	(063) 668 303	(067) 631 222
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Mr	LYNCH	Lew	Far North Coast County Council	Weeds Inspector	PO Box 238	CASINO	2470	(02) 795 5380	(02) 7A95 5004
Ms	LYNCH	Jo	Ku-ring-gai Municipal Council	Bshland Rehab Officer	818 Pacific Hwy	GORDON	2072	(069) 931 003	(065) 913 311
Mr	LYONS	Mitchell	Cabonne Council	Noxious Plants Inspector	PO Box 17	MOLONG	2866	(065) 913 108	(048) 230 456
Mr	MAGUIRE	Alan	NSW Agriculture	Supervisor	RMB 944	TAMWORTH	2340	(067) 711 700	(067) 711 893
Mr	MALLARD	Peter	Natl Parks & Wildlife Service	Snr Field Officer	PO Box 1189	QUEANBEYAN	2620	(066) 551 027	(066) 552 310
Dr	MALLEN-COOPER	Jane	Nox. Weeds Adv Comm.	Member (EPA)	L Bag 1502	BANKSTOWN	2200	(063) 334 377	(063) 334 491
Mr	MARR	Jerry	Hay Shire Council	Snr Environ. Health Offcr	PO Box 141	HAY	2711	(074) 748 100	(074) 748 252
Mr	MARTIN	Philip	Greater Taree City Council	Director Environ. & Planning	PO Box 482	TAREE	2430	(048) 321 022	(048) 322 066
Mr	MASSEY	John	Goulburn City Council	District Weeds Officer	PO Box 725	GOULBURN	2580	(064) 521 197	(064) 521 197
Mr	MATHEWS	Kevin	New England Tblnds C.C.	Chief Weeds Officer	PO Box 881	ARMIDALE	2350		
Mr	MATTHEWS	Graham	Bellingen Shire Council	Agronomist	PO Box 117	BELLINGEN	2454		
Ms	McDONALD	Latarnie	NSW Agriculture	Project Manager	PO Box 1386	BATHURST	2795		
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Cr	McGUINNES	Brian	Crookwell Shire Council	Lands Consultant Weeds	PO Box 10	CROOKWELL	2583		
Mr	McKENZIE	Alan	BHP		PO Box 768	COOMA	2630		

Mr	McLENNAN	Alex	Cobbett P/L	Trials & Res. Co-Ord	PO Box 240	HORNSBY	2077	(02) 477 7944	(02) 477 7363
Mr	McPHERSON	Paul	Tumbarumba Shire Council	Noxious Weeds Officer	PO Box 61	TUMBARUMBA	2653	(069) 482 022	(069) 482 865
Ms	McRAE	Lyn	Natl Parks & Wildlife Service	Protection Systems Officer	PO Box 98	PARRAMATTA	2150	(02) 895 7420	(02) 895 7414
Mr	MERTON	Peter	Nox. Weeds Adv. Comm.	RLPB	Journeys End	BATHURST	2795	(063) 377 762	
Mr	MILHAM	Paul	NSW Agriculture	Chemist	PMB 10	RYDALMERE	2116	(02) 683 9777	(02) 630 4475
Mr	MILLER	Ian	Dept Primary Ind & Fisheries	Princ Agronomist Weeds	GPO Box 990	DARWIN	801	(089) 992 270	(089) 992 049
Mr	MILLER	Ian	Dept Primary Industry & Fisheries	Principal Agronomist Weeds	GPO Box 990	DARWIN	801	(089) 992 270	(089) 992 049
Mr	MILNE	Barney	NSW Agriculture	Field Officer	AR & VC	ORANGE	2800	(063) 913 884	(063) 913 883
Mr	MILVAIN	Hugh	NSW Agriculture	Nox. Plants Adv. Offcr	Agric. Institute	YANCO	2703	(069) 530 290	(069) 530 200
Mr	MINEHAN	Damian	Sthn Slopes Nox Plants Auth	Chief Weeds Officer	PO Box 3	BOOROWA	2586	(063) 853 189	(063) 853 562
Mr	MITCHELL	Grant	Quik Spray		PO Box 825	MOOLOOLABAH	4557	1 800 645688	(07) 849 7130
Mr	MOORE	Glen	Gundagai Shire Council	Health & Building	Sheridan St	GUNDAGAI	2722	(069) 441 266	(069) 441 475
Mr	MOORE	Dale	Lake Macquarie City Council	Vegetation Control Officer	PO Box 1906	HNTR RGN MAIL CNT	2310	(049) 210 333	(049) 587 257
Mr	MORRISON	Jim	Leeton Shire Council	Weeds Officer	PO Box 394	LEETON	2705	(069) 532 611	(069) 533 337
Mr	MULDOON	Shane	Sydney Water	Catchment Prot. Offcr	PO Box 365	GUILDFORD	2161	(02) 795 4490	(02) 795 4322
Ms	MUNRO	Pat	Macspred Pty Ltd		PO Box 6887	WETHERILL PARK	2164	(02) 756 4433	(02) 756 4435
Dr	MURRAY	David	Nox. Weeds Adv. Comm.	Member	7 Acacia Ave	GWYNNEVILLE	2500	(042) 292 171	
Mr	NAZER	Chris	ACT City Parks	SOC	PO Box 1119	TUGGERANONG	2901	(06) 207 2525	(06) 207 2502
Mr	NEAVE	David	FNCCC	Operator	PO Box 238	CASINO	2476		
Mr	NELLIGAN	Kevin	Cowra Shire Council	Noxious Plants Manager	PO Box 342	COWRA	2794	(063) 410 148	(063) 411 031
Mr	NEYLAND	Glenn	Bland Shire Council	Noxious Weed Inspector	PO Box 21	WEST WYALONG	2671	(069) 722 266	(069) 722 145
Mr	NICHOLSON	Geof	Crookwell Shire Council	Weeds Officer	PO Box 10	CROOKWELL	2583	(048) 321 022	(048) 322 066
Mr	NICHOLSON	Ellis	NSW Ste Forests (NWAC)	Member (Forests)	PO Box J19	COFFS HARBOUR	2450	(066) 528 900	(066) 512 909
Mr	NIXON	David	Severn Shire Council	Weeds Officer	PO Box 447	GLEN INNES	2370	(067) 322 555	(067) 323 634
Mr	NORRIS	Ray	Council of Camden	Weeds Inspector	PO Box 183	CAMDEN	2571	(046) 552 455	(046) 552 770
Mr	NORTH	Brendon	Bega Valley Shire Council	Nox Weeds Insp	PO Box 492	BEGA	2550	(064) 929 400	(064) 923 323
Mr	NOTT	John	Hunter Catchment Mgmt Trust	Trustee	PO Box 297	MAITLAND	2320	(049) 335 455	(049) 335 164
Mr	NUTHALL	Greg	Nox. Weeds Adv. Comm.	Member (NSW Farmers Fed)	Dutton Park	YOUNG	2594	(063) 833 271	(063) 833 256
Mr	O'CONNELL	Robert	Central Northam County Council	Weeds Officer	PO Box 155	QUIRINDI	2343	(067) 461 755	(067) 663 038
Mr	O'LEARY	Wayne	Tallaganda Shire	Noxious Plants Inspector	PO Box 91	BRAIDWOOD	2622	(048) 422 225	(048) 422 669
Mr	OGILVIE	Allan							
Mr	OLIVE	Malcolm	Far North Coast County Council	Chairperson	PO Box 238	CASINO	2470	(066) 622 396	(066) 625 511
Mr	OLIVE	Malcolm	Nox. Weeds Adv Comm.	Shires Ass.	PO Box 238	CASINO	2470	(066) 622 396	(066) 625 511
Ms	OLSON	Samantha	Natl Parks & Wildlife Service	A/Pest Species Officer	PO Box 461	ROSE BAY	2029	(02) 337 5511	(02) 337 1303
Mr	PARKER	Terry	Yarrowlumla Council	Parks & Conservation Sup.	PO Box 112	QUEANBEYAN	2620	(06) 297 6113	(06) 297 5854
Mr	PASENOW	Eric	Dungog Shire Council	Noxious Plants Inspector	PO Box 95	DUNGOG	2420	(049) 921 224	(049) 922 044
Mr	PASQUALOTTO	Mario	MIA Rural Services	Operations Manager	PO Box 1594	GRIFFITH	2680	(069) 642 999	(069) 627 851
Mr	PATON	Bob	NSW Agriculture	Consultant	Locked Bag 21	ORANGE	2800	(063) 675 351	
Ms	PEARMAN	Sally	NSW Agriculture	Chief Legal Officer	L Bag 21	ORANGE	2800	(063) 913 562	(063) 913 563
Mrs	PETERSON	Marina	Defence - Army	Environmental Officer	P.A.S.C.	Liverpool Mltry Area	2174	(02) 600 4723	(02) 600 4648
Cr	PHILLIPS	Winston	Cooma-Monaro Shire	Councillor	PO Box 714	COOMA	2630	(064) 501 777	(064) 501 799

Mr PINES	Ken	Natl Parks & Wildlife Service	Pest Management Officer	PO Box 402	ARMIDALE	2350	(067) 737 129	(067) 711 894
Mr PITT	Darren	Natl Parks & Wildlife Service	Pest Control Officer	PO Box 72	NARRABRI	2390	(067) 924 724	(067) 921 133
Mr POMERY	David	Illawarra Dist (Nox) Weeds Auth.	Chief Weeds Officer	PO Box 148	KIAMA	2533	(042) 331 129	
Mr POPOVIC	Peter	NSW Agriculture	Nox. Plants Adv. Ofcr	PMB	GRAFTON	2460	(066) 420 449	(066) 447 251
Mr PORTBURY	Geoff	Jerilderie Shire Council	Noxious Weeds Inspector	PO Box 96	JERILDERIE	2716	(058) 861 200	(058) 861 701
Dr Powell	Jocelyn	HNCM Trust	Trustee Dir Res & Info	PO Box 556	WINDSOR	2756	(045) 774 243	(045) 774 236
Mr PROCTOR	Peter	NSW Agriculture	Bio Weeds Unit	PO Box 174	MUDGEE	2850	(063) 721 969	(063) 726 870
Mr QUINN	Jim	NSW Agriculture	Supervisor	PO Box 581	GOSFORD	2250	(043) 481 900	(043) 481 910
Mrs RAWLING	Judie	Nox. Weeds Adv. Comm.	Managing Director (UBM)	PO Box 62	ROSEVILLE	2069	(02) 413 4722	(02) 413 4156
Mr REEC	Bryson	Wellington Council	Weeds Inspector	PO Box 62	WELLINGTON	2820	(068) 452 099	(068) 453 354
Ms REES	Lynn	Natl Parks & Wildlife Service	Bush Regen. Co-Ordinator	Lady Game Dr	CHATSWOOD	2067	(02) 412 1811	(02) 411 6034
Mr RICHARDS	David	Gunnedah Shire Council	Chief Weeds Officer	PO Box 63	GUNNEDAH	2380	(067) 420 422	(067) 420 523
Mr RICHARDSON	Noel	Gundagai Shire Council	Councillor	Sheridan St	GUNDAGAI	2722	(069) 441 266	(069) 441 475
Cr RIDLEY	Suzanne	Yarrowlumla Council	Councillor	PO Box 112	QUEANBEYAN	2620	(06) 236 9251	
Mr RILEY	Geoffrey	Merriwa Shire Council	Weeds Officer	PO Box 111	MERRIWA	2329	(065) 482 109	(065) 482 340
Mr ROBERTS	Ken	Bombala Council	Noxious Plants Inspector	PO Box 105	BOMBALA	2632	(064) 583 555	(064) 583 777
Mr ROBERTS	Ron	New England Tblnds C.C.	District Weeds Officer	PO Box 881	ARMIDALE	2350	(067) 711 700	(067) 711 893
Mr ROBERTSON	Steve	Carrathool Shire Council	Snr Nox Weeds Officer	PO Box 12	GOOLGOWI	2652	(069) 651 306	(069) 651 379
Mr RODWAY	Steve	Corowa Shire Council	Snr Nox Weeds Inspector	PO Box 77	COROWA	2646	(060) 331 277	(060) 333 317
Mr ROGERS	Dick	Sutherland Shire Council	Bushcare Officer	PO Box 17	SUTHERLAND	2232	(02) 710 0192	(02) 710 0594
Mr ROLLINSON	Don	Cabonne Council	Senior Weeds Officer	PO Box 17	MOLONG	2866	(063) 668 303	(063) 668 799
Mr ROSSINGTON	Neil	Tenterfield Shire Council	Nox Weeds Officer	PO Box 214	TENTERFIELD	2372	(067) 361 744	(067) 362 669
Mr ROTH	Robin	Moree Plains Shire Council	Executive Manager	PO Box 420	MOREE	2400	(067) 529 533	(067) 522 425
Mr RUSBY	Michael	Broken Hill City Council	Assist Mgr Parks & Reserves	PO Box 448	BROKEN HILL	2880	(080) 889 220	(080) 878 740
Mr RUSSELL	Chris	Cobbett P/L	Technical Officer	PO Box 240	HORNSBY	2077	(02) 477 7944	(02) 477 7363
Mr RUSSELL	Barry	Shoalhaven City Council	Manager Eng Wks	PO Box 42	NOWRA	2541	(044) 293 111	
Mr RUTLEDGE	John	New England Tblnds C.C.	General Manager	PO Box 881	ARMIDALE	2350	(067) 711 700	(067) 711 893
Mr RYAN	Paul	Cooma-Monaro Shire	Weeds Officer	PO Box 714	COOMA	2630	(064) 501 777	(064) 501 799
Mr RYAN	John	Forbes Shire Council	Noxious Plant Inspector	PO Box 333	FORBES	2871	(068) 521 822	(068) 524 170
Mr RYAN	Bruce	Pacific Power	Land Management Officer	Wang Pwr Stn	WALLERAWANG	2845	(063) 528 641	(063) 528 740
Mr RYAN	John	Yarrowlumla Council	Noxious Plants Inspector	PO Box 112	QUEANBEYAN	2620	(06) 297 6113	(06) 297 5854
Mr SAINTY	Geoff	Sainty & Associates		PO Box 1219	POTTS POINT	2011	(02) 332 2661	(02) 331 5372
Mr SAMPSON	Barry	NSW Agriculture	Weeds Bio Unit	PMB	YANCO	2703	(069) 530 219	(069) 530 200
Mr SAMUELS	Wal	Wellington Council	Chief Weeds Officer	PO Box 62	WELLINGTON	2820	(068) 452 099	(068) 453 354
Ms SARGENT	Melinda	NSW Agriculture	District Agronomist	PO Box 141	KEMPSEY	2440	(065) 626 244	(065) 625 614
Mr SCHMITZER	Terry	Hastings Council	Weeds Officer	PO Box 84	PORT MACQUARIE	2444	(065) 832 099	(065) 842 445
Mr SCHWEITZER	Peter	Far North Coast County Council	Inspector	PO Box 238	CASINO	2470	(066) 841 983	
Mr SCOTT	Bruce	Far North Coast County Council	General Manager	PO Box 238	CASINO	2470	(066) 622 396	(066) 625 511
Mr SHANAHAN	Geoff	Upper Macquarie County Council	Nox Weeds Insp	PO Box 703	BATHURST	2795	(063) 314 200	(063) 312 121
Mr SHARP	Malcolm	Orange City Council	Weeds Inspector	PO Box 35	ORANGE	2800	(063) 615 111	(063) 615 199
Cr SHAW	John	Gunning Shire Council	Councillor	PO Box 32	GUNNING	2581	(048) 451 304	

Mr SHEARGOLD	Wayne	Parkes Shire Council	Noxious Weed Officer	PO Box 337	PARKES	2870	(068) 628 333
Cr SHORE	Les	Nox Weeds Adv Comm	Member	56 Cattai Rg	RdGLENORIE	2157	(02) 652 1428
Mr SILVESTER	Stephen	Cobbett P/L	Sales & Marketing Mgr	PO Box 240	HORNSBY	2077	(02) 477 7944
Mr SIMS	Ray	June Shire Council	Nox. Weeds & Environ. Offcr	PO Box 93	JUNEE	2663	(069) 242 497
Mr SINGLETON	Ian	Hume Shire Council	Weeds Inspector	PO Box 70	ALBURY	2640	(060) 213 177
Ms SKINNER	Lesley	NSW Agriculture	Legal Officer (Legislation)	L Bag 21	ORANGE	2800	(063) 913 550
Mr SLY	Alan	Narramine Shire Council	Noxious Weed Inspector	PO Box 115	NARRAMINE	2821	(068) 891 322
Mr SMITH	Alan	Bega Valley Shire Council	Snr Nox Weeds Insp	PO Box 492	BEGA	2550	(064) 929 400
Mr SMITH	Edward	Sthn Slopes Nox Plants Auth	Nox Plants Inspector	PO Box 3	BOOROWA	2586	(063) 853 189
Mr SPONG	Joe	Wakool Shire Council	Noxious Weeds Inspector	PO Box 40	MOULAMEIN	2733	(058) 875 007
Mrs SPOTSWOOD	Sonia	Goulburn City Council	Manager Environ. Services	PO Box 725	GOULBURN	2580	(048) 230 409
Mr SPROULE	Bob	NSW Agriculture	Regl Dir Agric.	PO Box 389	GOULBURN	2580	(048) 230 624
Miss STEINFURTH	Michelle	HNCMT	Resource Officer	PO Box 556	WINDSOR	2756	(045) 774 243
Cr STEWART	Leigh	Snowy River Council	Councillor	2 Myack St	BERRIDALE	2628	(064) 563 251
Cr STEWART	Leigh	Snowy River Council	Councillor	2 Myack St	BERRIDALE	2628	(064) 563 251
Mr STIEGER	Doug	North West Weeds	Noxious Plants Inspector	PO Box 93	WARIALDA	2402	(067) 291 016
Cr STOCKHAM	C	Castlereagh Macq C Council	Chairman	PO Box 31	WALGETT	2832	(068) 281 399
Mr STORM	Shane	Wakool Shire Council	Ganger	PO Box 40	MOULAMEIN	2733	(058) 875 103
Mr STORRIE	Andrew	NSW Agriculture	Weeds Agronomist	RMB 994	TAMWORTH	2340	(067) 631 174
Mrs STUBBS	Val	Mid Western County Council	Secretary	PO Box 138	MUDGE	2850	(063) 72 1300
Mr SULLIVAN	Paul	NSW Agriculture	Tech. Offcr (Sc)	RMB 944	TAMWORTH	2340	(067) 631 175
Mr TANNER	Les	NSW Agriculture	Snr Insp (Weeds)	Locked Bag 21	ORANGE	2800	(063) 913 153
Mr TAYLOR	Frank	Cropcare	NSW Development Manager	PO Box 182	WAGGA WAGGA	2650	(069) 223 098
Mr TERRETT	Peter	Global Star		PO Box 222	FOREST HILL	3131	(03) 9894 2600
Mr THERIAULT	David	DowEianco	Product Marketing Manager	L Bag 502	FRENCHS FOREST	2086	(02) 975 0159
Mr THOMAS	Jeff	Natl Parks & Wildlife Service	Project Officer	PO Box 361	GRAFTON	2460	(066) 420 613
Mr THURLING	Robert	Wagga Wagga City Council	Chief Noxious Weeds Officer	PO Box 20	WAGGA WAGGA	2650	(069) 235 257
Mr TICKNER	Graham	Gundagai Shire Council	General Manager	Sheridan St	GUNDAGAI	2722	(069) 441 266
Mr TINK	Gordon	DowEianco	Field Salesman	PO Box 1354	ORANGE	2800	(063) 652 223
Mr TOTH	John	NSW Agriculture	Research Agronomist	PMB 10	RYDALMERE	2116	(02) 683 9777
Mr TOWNSEND	Norm	Cabonne Council	Chief Weeds Officer	PO Box 17	MOLONG	2866	(063) 668 303
Mr TROUNCE	Bob	NSW Agriculture	Weeds Agronomist	Locked Bag 21	ORANGE	2800	(063) 913 156
Mr TULL	Mark	Gloucester Shire Council	Weeds Inspector	PO Box 11	GLOUCESTER	2422	(065) 581 601
Mr TURTON	Craig	Snowy River Shire Council	Weeds Officer	2 Myack St	BERRIDALE	2628	(064) 563 251
Mr TYE	Ian	Maclean Shire Council	Chief Nox. Weeds Inspector	PO Box 171	MACLEAN	2463	(066) 452 555
Mr VANDERVELDE	Tom	North West Weeds	Noxious Plants Inspector	PO Box 93	WARIALDA	2402	(067) 291 016
Mrs WALLACE	Jackie	Wollondilly Shire Council	Clerical Support	PO Box 21	PICTON	2571	(046) 771 326
Mr WALLER	Rob	Far North Coast County Council	Inspector	PO Box 238	CASINO	2470	(066) 841 584
Mr WALMSLEY	Pat	Sthn Slopes Nox Plants Auth	Nox Plants Inspector	PO Box 3	BOOROWA	2586	(063) 853 189
Mr WARTON	Gary	Council of Camden	Senior Engineering Assistant	PO Box 183	CAMDEN	2571	(046) 552 455
Cr WASS	David	Castlereagh Macq C Council	Chairman	PO Box 31	WALGETT	2832	(068) 281 399

Mr WATERS	Kevin	New England Tblnds C.C.	Mgr Noxious Weed Control	PO Box 881	ARMIDALE	2350	(067) 711 700	(067) 711 893
Mr WATSON	Martin	Dow Elanco	Field Sales	PO Box 1000	WAGGA WAGGA	2650	(069) 219 408	(069) 219 544
Cr WEARNE	John	Shires Association of NSW	President	GPO Box 7003	SYDNEY	2001	(02) 299 7711	(02) 262 1049
Dr WESTERINK	Jan	Aust. Grad Schl Police Mgmt	Consultant Lecturer	PO Box 168	MANLY	2095	(02) 977 5800	
Mr WIELAND	Lyndon	Wellington Council	Weeds Inspector	PO Box 62	WELLINGTON	2820	(068) 452 099	(068) 453 354
Mr WILLIAMS	David	Cessnock City Council	Weed Control Officer	PO Box 152	CESSNOCK	2325	(049) 910 336	(049) 902 324
Mr WILSON	Carl	Agriculture L/Care	Pest Control	PO Box 1038	TUGGERANONG	2901	(06) 207 2276	(06) 207 2268
Mr WILSON	Ian	North West Weeds	Chief Weeds Officer	PO Box 93	WARRIALDA	2402	(067) 291 016	(067) 291 400
Dr WILSON	Bruce	QLD Department of Lands	Manager Development	L Bag 40	COOPAROO DEL CTR	4151	(07) 3406 2873	(07) 3406 2875
Mr WOODS	Kevin	Carrathool Shire Council	Snr Nox Weeds Officer	PO Box 12	GOOLGOWI	2652	(069) 651 306	(069) 651 379
Mr WOODS	Len	Nox. Weeds Adv. Comm.	Shires Assoc	Kylee	NIANGALA	2354	(067) 692 251	(067) 692 237
Mr WOODS	Neville	Sthn Slopes Nox Plants Auth	Nox Plants Inspector	PO Box 3	BOOROWA	2586	(063) 853 189	(063) 853 562
Mr WOODS	Errol	Ulmarra Shire Council	Weeds Inspector	PO Box 13	ULMARRA	2462	(066) 445 303	(066) 445 366
Mr WORBOYS	Graeme	O'Malleys IAMA	Customer Services Co-Ord	PO Box 504	COOTAMUNDRA	2590	(069) 401 404	(069) 424 011

